GROUP 35A

BASIC BRAKE SYSTEM

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GENERAL INFORMATION

M1351000100989

Brake systems with higher reliability and durability have achieved distinguished braking performance.

FEATURES

IMPROVEMENT OF BRAKING PERFORMANCE

- A 10-inch single brake booster with the variable boost ratio mechanism has been used to assure maximum braking force with less pedal pressure in case of emergency. <Vehicles with ABS>
- In addition to the 10-inch single brake booster, a small and long stroke-type master cylinder has been adopted to achieve downsizing and secure assist force.
- 15-inch or 16-inch ventilated disc brakes have been adopted for the front.
- 8-inch leading trailing-type drum brake, 14-inch or 16-inch solid disc brake has been adopted for the rear.

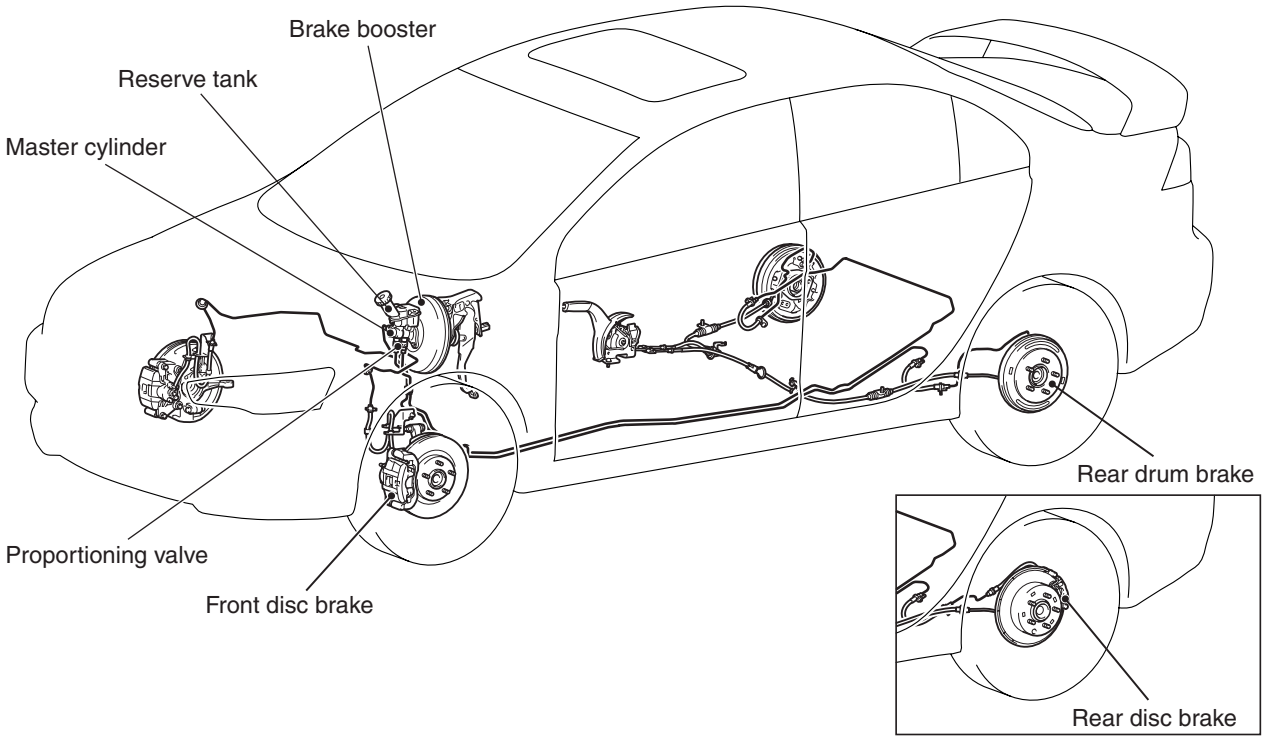
IMPROVEMENT IN SAFETY

- The 4-wheel anti-lock brake system (4ABS) has been installed to prevent slippage resulting from the wheel lock and assure stable vehicle posture and driveability.<Vehicles with ABS>
- A rear wheel early lock-prevention proportioning valve has been used. <Vehicles without ABS>
- Electronic control braking force distribution system (EBD) has been adopted to assure the maximum braking force independently of the passenger's position in the vehicle. <Vehicles with ABS>
- X-type piping of brake lines have been adopted for the front and rear wheels.
- Audible wear indicators are used on the front and rear brake pads to warn the driver of wear limit.

SERVICE QUALITY IMPROVEMENTS

- Diagnostic function has been adopted to ABS for easier inspection. <Vehicles with ABS>
- Brake fluid reservoir, master cylinder, and brake booster have been integrated for downsizing and better serviceability.

<Vehicles without ABS>



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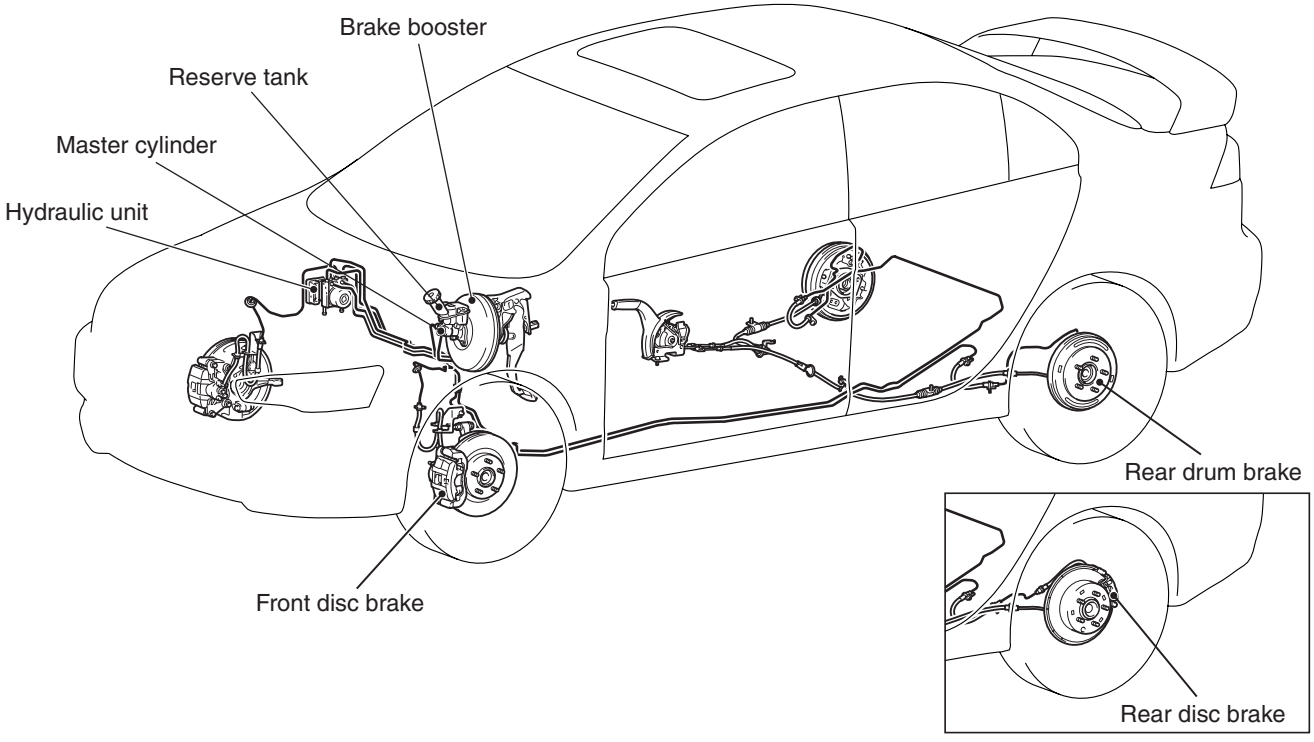
<Vehicles with ABS>



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TSB Revision

GENERAL SPECIFICATIONS

M1351000200577

Item			Specifications
Master cylinder	Type		Tandem type
	ID mm (in)		20.6 (0.81)
Brake booster	Type		Vacuum type, single
	Effective dia. of power cylinder mm (in)		254 (10.0)
	Boost ratio	Vehicles without ABS	6.5 (Pedal pressure: 188N)
		Vehicles with ABS	6.5 (Pedal pressure: 92N) 8.5 (Pedal pressure: 156N)
Rear wheel hydraulic control type		Vehicles without ABS	Proportioning valves
		Vehicles with ABS	Electronic control braking force distribution system (EBD)
Front disc brake	Type	Vehicles with 16-inch wheel	Floating caliper 1 piston ventilated disc (V5-S57)
		Vehicles with 18-inch wheel	Floating caliper 1 piston ventilated disc (V6-S57)
	Disc effective dia × thickness mm (in)	Vehicles with 16-inch wheel	222 × 26 (8.7 × 1.02)
		Vehicles with 18-inch wheel	241.6 × 26 (9.5 × 1.02)
	Cylinder I.D. mm (in)		57.1 (2.25)
	Pad thickness mm (in)		10.0 (0.39)
	Clearance adjustment		Automatic adjustment
Rear drum brake	Type		Leading trailing drum
	Drum ID mm (in)		203 (8.0)
	Wheel cylinder ID mm (in)		19.0 (0.75)
	Lining thickness mm (in)		4 (0.157)
	Clearance adjustment		Automatic
Rear disc brake	Type	Vehicles with 16-inch wheel	Floating caliper 1 piston solid disc (S4-S35)
		Vehicles with 18-inch wheel	Floating caliper 1 piston solid disc (S6-S35)
	Disc effective dia × thickness mm (in)	Vehicles with 16-inch wheel	226 × 10 (8.9 × 0.39)
		Vehicles with 18-inch wheel	258 × 10 (10.2 × 0.39)
	Cylinder I.D. mm (in)		34.9 (1.37)
	Pad thickness mm (in)		10.0 (0.39)
	Clearance adjustment		Automatic adjustment

SERVICE SPECIFICATIONS

M1351000301232

Item			Standard value	Limit
Brake pedal height mm (in)			219.8 –227.8 (8.7 –9.0)	–
Dimension from the brake booster stud bolt end to the clevis hole center mm (in)			75.8 –80.2 (2.98 –3.16)	–
Brake pedal free play mm (in)			3 –8 (0.12 –0.31)	–
Proportioning valve output fluid pressure MPa (psi) <Vehicles without ABS>	Vehicles with rear drum brake	Split point	2.21 –2.70 (320 – 391)	–
		When input fluid pressure is 6.86 MPa (996 psi).	3.29 –3.82 (477 – 554)	–
	Vehicles with rear disc brake	Split point	1.81 –2.21 (262 – 320)	–
		When input fluid pressure is 6.86 MPa (996 psi).	2.33 –3.46 (338 – 501)	–
Proportioning valve output fluid pressure difference between left and right MPa (psi)			–	0.5 (73)
Pedal-to-floor clearance when brake pedal is depressed mm (in) [Pedal depression force: approx. 500 N]			85 (3.35) or more	–
Fluid pressure generated by brake booster non-servo effect test kPa (psi)	Vehicles without ABS	Pedal depression force: 100 N	0 –600 (0 –87)	–
		Pedal depression force: 300 N	1,380 –2,220 (200 – 322)	–
	Vehicles with ABS	Pedal depression force: 100 N	0 –590 (0 –85)	–
		Pedal depression force: 300 N	1,360 –2,180 (197 – 316)	–
Fluid pressure generated by brake booster servo effect test kPa (psi)	Vehicles without ABS	Pedal depression force: 100 N	4,670 –5,910 (677 –857)	–
		Pedal depression force: 300 N	10,720 –11,560 (1,555 –1,676)	–
	Vehicles with ABS	Pedal depression force: 100 N	4,850 –6,460 (703 –937)	–
		Pedal depression force: 300 N	10,550 –11,380 (1,530 –1,650)	–

TSB Revision

Item		Standard value	Limit
Front disc brake	Pad thickness mm (in)	10.0 (0.39)	Minimum 2.0 (0.08)
	Brake disc thickness mm (in)	26.0 (1.02)	Minimum 24.4 (0.96)
	Brake disc runout mm (in)	–	0.06 (0.0024)
	Brake drag force N (lb)	68 (15.3) or less	–
Rear disc brake	Pad thickness mm (in)	10.0 (0.39)	Minimum 2.0 (0.08)
	Brake disc thickness mm (in)	10.0 (0.39)	Minimum 8.4 (0.33)
	Brake disc runout mm (in)	–	0.08 (0.0032)
	Brake drag force N (lb)	68 (15.3) or less	–
Rear drum brake	Brake lining thickness mm (in)	4.0 (0.16)	Minimum 1.0 (0.04)
	Brake drum inside diameter mm (in)	203 (8.0)	205 (8.1)
Front wheel bearing looseness mm (in)		–	0.05 (0.0020)
Rear wheel bearing looseness mm (in)		–	0.05 (0.0020)
Brake pedal distortion mm (in)	<M/T>	237 –245 (9.3 –9.6)	–
	<CVT>	240 –248 (9.4 –9.8)	–

LUBRICANTS

M1351000400861

Item	Specified lubricant	Quantity
Brake fluid	DOT3 or DOT4	Adequate
Master cylinder body, wheel cylinder body, piston cup, piston, piston seal		
Guide pin, lock pin, pin boot, bushing	Repair kit grease (solid orange)	
Boot ring, piston boot	Repair kit grease (translucent red)	
Backing plate, Auto adjuster assembly	Chuo Yuka AKB 100 or equivalent	
Boots	Repair kit grease	2 g (0.070 oz)

BASIC BRAKE SYSTEM DIAGNOSIS

INTRODUCTION TO BASIC BRAKE SYSTEM DIAGNOSIS

M1351009700397

Hydraulic brakes are composed of the brake pedal, master cylinder, brake booster and disc or drum brakes. Malfunctions such as insufficient braking power or the generation of noise may occur due to wear, damage or incorrect adjustment of these components.

BASIC BRAKE SYSTEM DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1351009800372

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a basic brake system fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the symptom chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

M1351009900409

Symptoms	Inspection procedure No.	Reference page
Vehicle pulls to one side when brakes are applied	1	P.35A-8
Insufficient braking power	2	P.35A-9
Increased pedal stroke (Reduced pedal-to-floor board clearance)	3	P.35A-11
Brake drag	4	P.35A-12
Scraping or grinding noise when brake are applied	5	P.35A-13
Squealing, groaning or chattering noise when brake are applied	6	P.35A-14
Squealing noise when brakes are not applied	7	P.35A-15
Groaning, clicking or rattling noise when brakes are not applied	8	P.35A-17

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Vehicle Pulls to One Side when Brakes are Applied

DIAGNOSIS

STEP 1. Check for oil, water, etc., on the pad contact surface of all brakes.

Q: Is oil, water, etc., on the pad contact surface?

YES : Replace the part and determine the source/cause of foreign material. Then go to Step 5.

NO : Go to Step 2.

STEP 2. Check disc brake pistons for smooth operation.

(1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserves.

(2) Test each disc brake assembly one at a time.
   a. Remove the lower caliper bolt, then remove caliper from mount.
   b. Have an assistant slowly depress the brake pedal. Confirm piston(s) extend slowly and smoothly with no jumpiness. Repeat for each disc brake assembly.

Q: Do (does) the piston(s) move correctly?

YES : Go to Step 3.

NO : Disassemble and inspect the brake assembly (Front: refer to P.35A-41 <Vehicles with 16-inch wheel> or P.35A-44 <Vehicles with 18-inch wheel>, Rear: refer to P.35A-49 <Vehicles with 16-inch wheel> or P.35A-51 <Vehicles with 18-inch wheel>). Then go to Step 5.

STEP 3. Check brake disc(s) for runout.
Refer to P.35A-29.

Q: Is runout outside of specifications?
YES : Repair or replace the brake disc(s) as necessary. Then go to Step 5.
NO : Go to Step 4.

STEP 4. Check brake discs for correct thickness.
Refer to P.35A-29.

Q: Is the thickness outside of specifications?
YES : Repair or replace the brake disc(s) as necessary. Then go to Step 5.
NO : Perform the brake line bleeding. Then go to Step 5.

STEP 5. Retest the system.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Start over at Step 1. If a new symptom appears, refer to the appropriate symptom chart.

INSPECTION PROCEDURE 2: Insufficient Braking Power

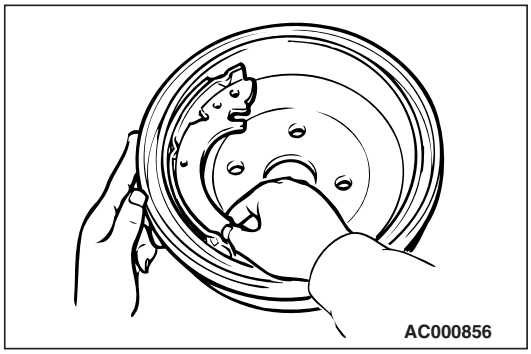
DIAGNOSIS

STEP 1. Check whether the brake fluid is low, is the correct fluid (A/T fluid, engine oil, etc.) or is contaminated (debris, sand, etc).

Q: Is there fault?
YES : Refill or replace with the specified brake fluid DOT 3 or DOT 4. Bleed the brakes if necessary (Refer to P.35A-25). Then go to Step 9.
NO : Go to Step 2.

STEP 2. Check for spongy (not firm brakes).
(1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserve.
(2) With the brake pedal fully released, depress the brake pedal slowly until it stops.
(3) With a measuring stick (ruler, etc.) next to the brake pedal, depress the pedal firmly and measure the distance the pedal traveled.

Q: Is the distance greater than 20 mm (0.8 inch)?
YES : Bleed the brakes to remove air in the fluid (Refer to P.35A-25). Then go to Step 9.
NO : Go to Step 3.



STEP 3. Check the lining and brake drum contact. <Vehicles equipped with rear drum brake>

(1) If equipped with rear disc brake, go to Step 5.
(2) Put chalk on the inner surface of the brake drum. Rub the lining against the drum inner surface.

NOTE: Clean off chalk after check.

Q: Does the lining wipe off or smudge the chalk across the full width of the lining?

YES : Go to Step 5.
NO : Replace the shoe and lining assemblies on both sides. Go to Step 9.

STEP 4. Check the auto adjuster function. <Vehicles equipped with rear drum brake>

Refer to P.35A-33.

Q: Is there fault?

YES : Repair it. Then go to Step 9.
NO : Go to Step 5.

STEP 5. Check the brake booster function.

Refer to P.35A-21.

Q: Is there fault?

YES : Replace the part. Then go to Step 9.
NO : Go to Step 6.

STEP 6. Check for pinched or restricted brake tube or hose.

Q: Is there pinched or restricted brake tube or hose?

YES : Replace that complete section of brake tube or brake hose. Then go to Step 9.
NO : Go to Step 7.

STEP 7. Check for oil, water, etc., on the pad or lining contact surfaces of all brakes.

Q: Is oil, water, etc., on the pad or lining contact surface?

YES : Replace the part and determine and repair source/cause of foreign material. Recheck symptom. Then go to Step 9.
NO : The procedure is complete. If condition persists, go to Step 8.

STEP 8. Check the proportioning valve operation.

Refer to P.35A-24.

Q: Is there fault?

YES : Replace the part. Then go to Step 9.
NO : Go to Step 9.

STEP 9. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart P.35A-8.

INSPECTION PROCEDURE 3: Increased Pedal Stroke (Reduced Pedal-to-Floor Board Clearance)

DIAGNOSIS

STEP 1. Check for spongy (not firm) brakes.

(1) With engine not running, depress the brake pedal rapidly several times to deplete booster vacuum reserve.
(2) With the brake pedal fully released, depress the brake pedal slowly until it stops.
(3) With a measuring device (ruler, etc.) next to the brake pedal, depress the pedal firmly and measure the distance the pedal traveled.

Q: Is the distance greater than 20 mm (0.8 inch)?

YES : Bleed the brakes to remove air in the fluid (Refer to P.35A-25). Then go to Step 6.

NO : Go to Step 2.

STEP 2. Check the pad for wear.

Refer to P.35A-26.

Q: Is the pad thickness outside of specifications?

YES : Replace the part. Then go to Step 6.

NO : Go to Step 3.

STEP 3. Check the vacuum hose and check valve for damage.

Refer to P.35A-24.

Q: Is there a damage?

YES : Replace the part. Then go to Step 6.

NO : Go to Step 4.

STEP 4. Check the master cylinder function.

Refer to P.35A-34.

Q: Is there a fault?

YES : Repair it. Then go to Step 6.

NO : Go to Step 5.

STEP 5. Check for brake fluid leaks.

Q: Is there a leak?

YES : Check the connection for looseness, corrosion, etc. Clean and repair as necessary. If leaking in any tube or hose section, replace the complete tube or hose. Then go to Step 6 .

NO : Go to Step 6.

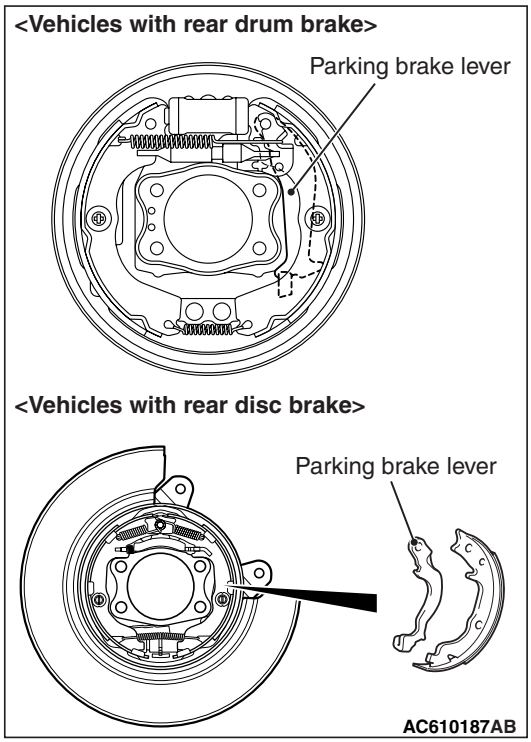
STEP 6. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 4: Brake Drag



DIAGNOSIS

STEP 1. Check the parking brake lever return.

Q: Is the operation faulty?

YES : Repair it. Then go to Step 7.
NO : Go to Step 2.

STEP 2. Check the brake shoe springs for breakage.

Q: Are the brake shoe springs broken?

YES : Replace the spring. Then go to Step 7.
NO : Go to Step 3.

STEP 3. Check the amount of grease at each sliding section.

Refer to P.35A-54 or GROUP 36, Parking Brake Lining and Drum P.36-15.

Q: Is the grease amount low?

YES : Apply grease. Then go to Step 7.
NO : Go to Step 4.

STEP 4. Check the parking brake pull amount.

Refer to GROUP 36, On-vehicle Service –Parking Brake lever Stroke Check and Adjustment P.36-10.

Q: Is there a fault?

YES : Adjust it. Then go to Step 7.
NO : Go to Step 5.

STEP 5. Check port for clogging.

Q: Is the port clogged?

YES : Repair it. Then go to Step 7.
NO : Go to Step 6.

STEP 6. Check disc brake pistons for sticking.
Depress the brake pedal, then release. Confirm each wheel spins freely.

Q: Does any wheel stick?

YES : Inspect that brake assembly. Then go to Step 7.
NO : Go to Step 7.

STEP 7. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 5: Scraping or Grinding Noise when Brakes are Applied

DIAGNOSIS

STEP 1. Check the front brakes, then rear brakes, for metal-to-metal condition.

Q: Is any metal-to-metal contact evident?

YES : Repair or replace the components. Then go to Step 6.
NO : Go to Step 2.

STEP 2. Check for interference between the caliper and wheel.

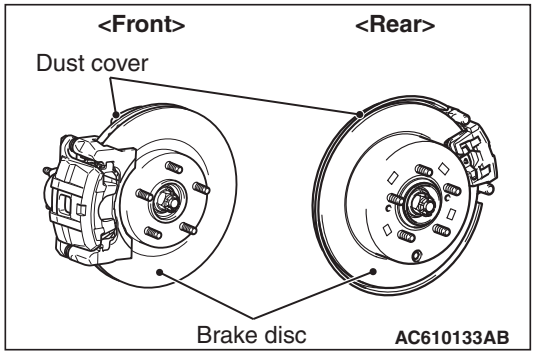
Q: Is there any interference?

YES : Repair or replace the part. Then go to Step 6.
NO : Go to Step 3.

STEP 3. Check for interference between the dust cover and brake disc.

Q: Is there any interference?

YES : Repair or replace the part. Then go to Step 6.
NO : Go to Step 4.



STEP 4. Check the brake drums or discs for cracks.

Q: Are there cracks?

YES : Repair or replace the part. Then go to Step 6.
NO : Go to Step 5.

STEP 5. Check for bent backing plate(s).

Q: Is (Are) the backing plate(s) bent?

YES : Repair or replace the part. Then go to Step 6.
NO : Go to Step 6.

STEP 6. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 6: Squealing, Groaning or Chattering Noise when Brakes are Applied

DIAGNOSIS

STEP 1. Check the brake disc and pads for wear or cutting.

Q: Is there wear or cutting?

YES : Repair or replace the part. Then go to Step 4.
NO : Go to Step 2.

STEP 2. Check the calipers for rust.

Q: Is there any rust?

YES : Remove the rust. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Adjust the brake pedal.

Refer to P.35A-19.

Q: Is the brake pedal adjusted correctly?

YES : Go to Step 4.
NO : Adjust the brake pedal. Then go to Step 4.

STEP 4. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 7: Squealing Noise when Brakes are not Applied

DIAGNOSIS

STEP 1. Check whether the backing plate is bent or loose and interfering with the drum.

Q: Is there a fault?

YES : Replace the part. Then go to Step 8.
NO : Go to Step 2.

STEP 2. Check whether the drum is damaged due to interference with the backing plate or shoe.

Q: Is there any damage?

YES : Replace the part. Then go to Step 8.
NO : Go to Step 3.

STEP 3. Check the brake drum for wear and the shoe spring for damage.

Q: Is there any wear or damage?

YES : Replace the part. Then go to Step 8.
NO : Go to Step 4.

STEP 4. Check the brake discs for rust.

Q: Are the brake discs rusted?

YES : Remove the rust by using sand paper. If still rusted, turn the rotors with an on-the-car brake lathe. Then go to Step 8.
NO : Go to Step 5.

STEP 5. Check the brake pads for correct installation.

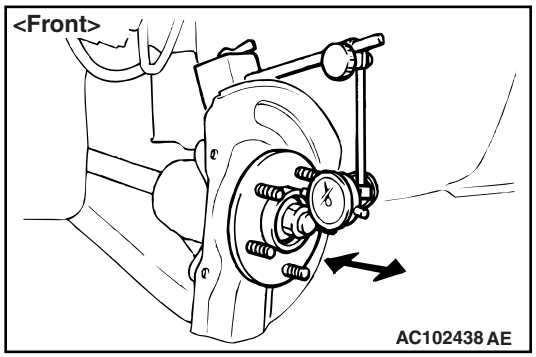
Q: Are the pads installed incorrectly?

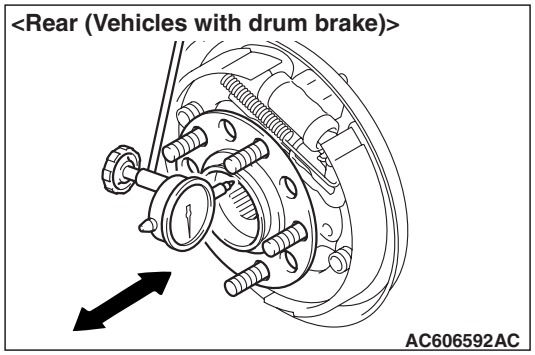
YES : Install the pads correctly. Then go to Step 8.
NO : Go to Step 6.

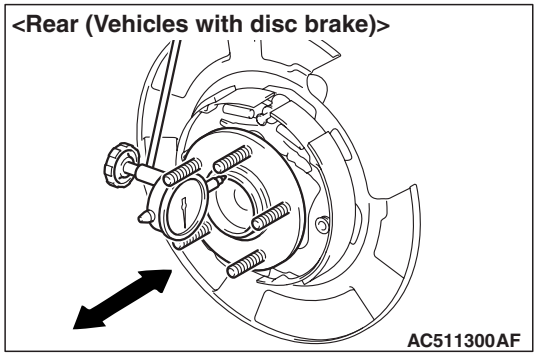
STEP 6. Check the calipers for correct installation.

Q: Are the calipers installed incorrectly?

YES : Install the calipers correctly. Then go to Step 8.
NO : Go to Step 7.







STEP 7. Check the wheel bearings for end play.

(1) Remove the brake discs or drums.
(2) Place a dial gauge as shown, and measure the end play while moving the hub in the axial direction.

Limit: 0.05 mm (0.002 inch)

Q: Does the measured end play exceed the limit?

YES : Replace the faulty hub assembly. Then go to Step 8.
NO : Go to Step 8.

STEP 8. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

INSPECTION PROCEDURE 8: Groaning, Clicking or Rattling Noise when Brakes are not Applied.

DIAGNOSIS

STEP 1. Check whether foreign material has entered the wheel covers.

Q: Is there any foreign material?

YES : Remove it. Then go to Step 5.
NO : Go to Step 2.

STEP 2. Check for looseness of the wheel nuts.

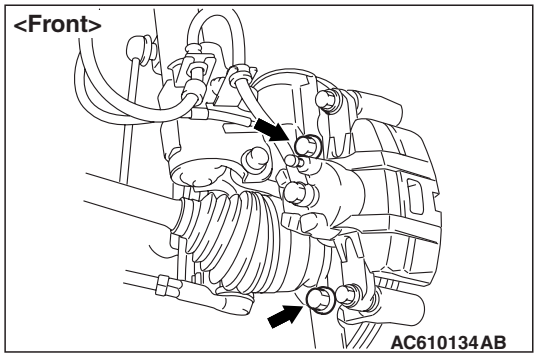
Q: Are the wheel nuts loose?

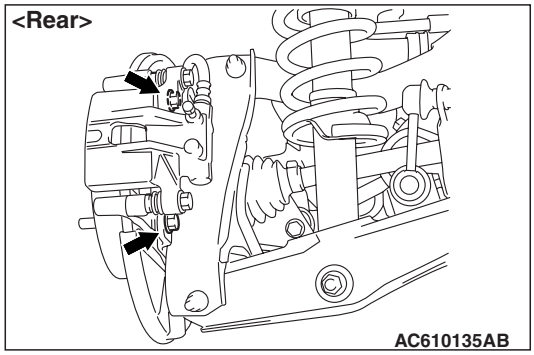
YES : Tighten to 98 ±10 N· m (73 ±7 ft-lb). Then go to Step 5 .
NO : Go to Step 3.

STEP 3. Check for looseness of the caliper installation bolt.

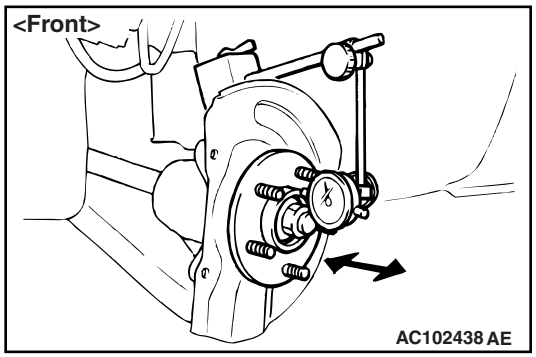
Q: Is the caliper installation bolt loose?

YES : Tighten to 100 ±10 N· m (74 ±7 ft-lb) for the front caliper. Tighten to 55 ±5 N· m (41 ±3 ft-lb) for the rear caliper. Then go to Step 5.
NO : Go to Step 4.



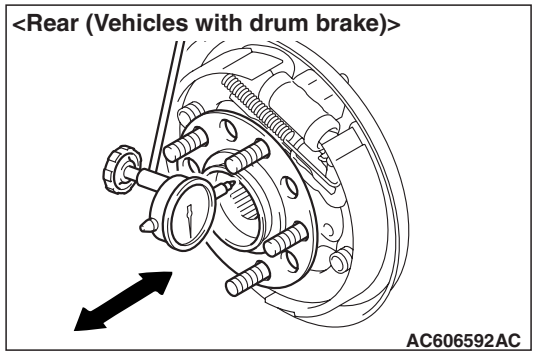


<Front>



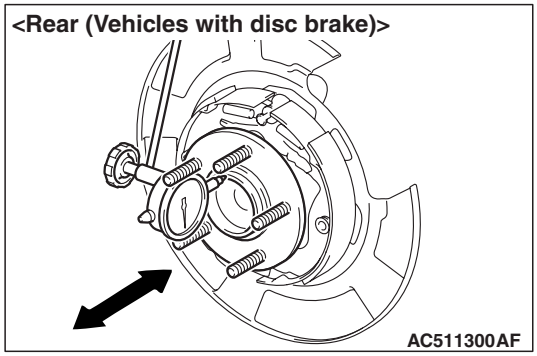
AC102438 AE

<Rear (Vehicles with drum brake)>



AC606592AC

<Rear (Vehicles with disc brake)>



AC511300AF

STEP 4. Check the wheel bearings for end play.

(1) Remove the brake discs or drums.
(2) Place a dial gauge as shown, and measure the end play while moving the hub in the axial direction.

Limit: 0.05 mm (0.002 inch)

Q: Does the measured end play exceed the limit?

YES : Replace the faulty hub assembly. Then go to Step 5.
NO : Go to Step 5.

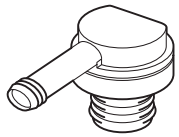
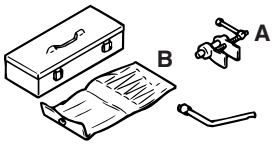
STEP 5. Recheck symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at step 1. If a new symptom surfaces, refer to the symptom chart.

SPECIAL TOOL

M1352000601366

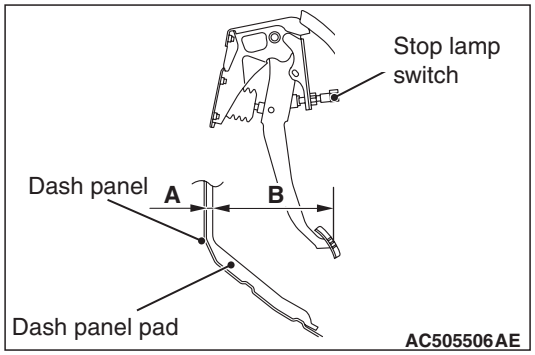
Tool	Number	Name	Use
 MB992146	MB992146	Booster test adapter	Inspection using a simplified tester
 MB990964	MB990964 A: MB990520 B: MB990619	Brake tool set A: Piston expander B: Installer	• Disc brake piston pushing back • Installation of the drum brake wheel cylinder piston cup

ON-VEHICLE SERVICE

BRAKE PEDAL CHECK AND ADJUSTMENT

M1351000900930

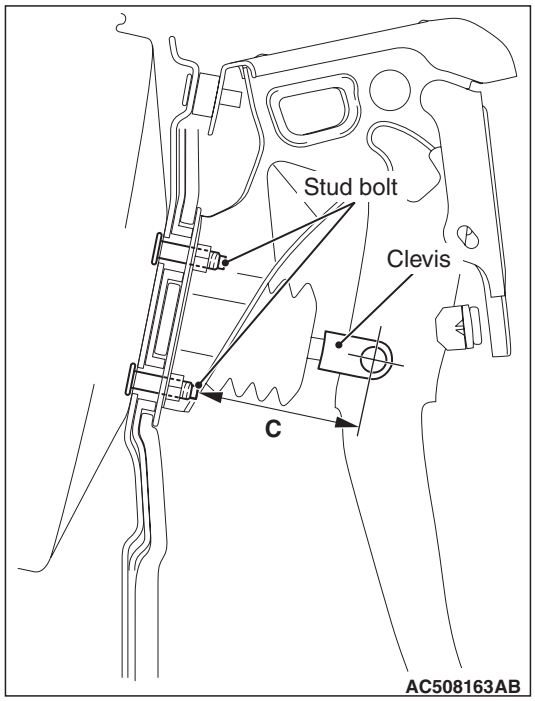
BRAKE PEDAL HEIGHT CHECK



1. Turn up the floor carpet under the brake pedal.
2. Remove the stop lamp switch (Refer to P.35A-34).
3. Use a needle or similar tool to measure the dimension A in the figure (distance from the dash panel pad surface to the dash panel).
4. Measure the dimension B in the figure (distance from the pedal pad surface to the dash panel pad surface).
5. Make sure that the total of the dimensions A and B measured in Steps 2 and 3 (brake pedal height) is within the standard value.

   Standard value (A+B): 219.8 –227.8 mm (8.7 –9.0 inch)

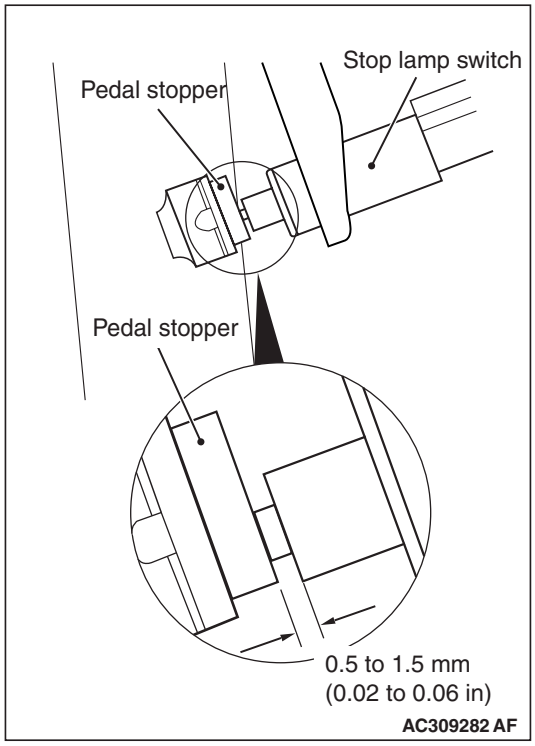
6. When the brake pedal height is not within the standard value, inspect the brake pedal in the following procedure.
   (1) Remove the brake pedal assembly (Refer to P.35A-34).
   (2) Check the removed brake pedal assembly for distortion, and replace it when deformed (Refer to P.35A-35).
   (3) Install the brake pedal assembly (Refer to P.35A-34).
   NOTE: When installing, compress the dash panel pad.



(4) Measure the brake pedal height again, and make sure that it is within the standard value (A+B).
When the measured value is not within the standard value, measure the dimension C in the figure (distance from the stud bolt end to the clevis hole center), and make sure it is within the standard value (C).

Standard value (C): 75.8 –80.2 mm (2.98 –3.16 inch)

(5) When the measured value is not within the standard value (C), replace the brake booster (Refer to P.35A-36).



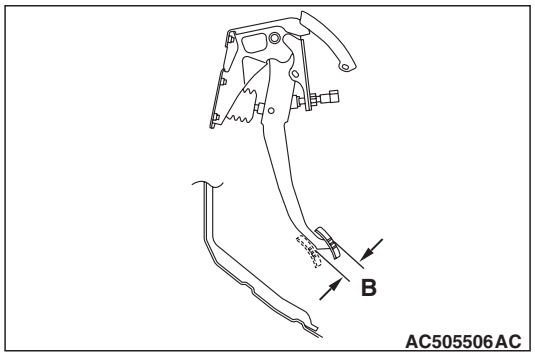
7. After checking the brake pedal height, install the stop lamp switch in the following procedure:
   (1) Screw in the stop lamp switch until its thread contacts the pedal stopper, then turn the switch approximately one eighth of a clockwise turn to fix it. While doing this, pull and hold the brake pedal by hand.
   (2) Check that the clearance between the stop lamp switch and the pedal stopper is as shown in the figure.

⚠ CAUTION

Make sure that the stop lamp is not illuminated when the brake pedal is not depressed.

   (3) Connect the stop lamp switch connector.
8. Check the key interlock mechanism and the shift lock mechanism (Refer to GROUP 23 –On-vehicle Service, Shift Lock Mechanism Check P.23A-143).
9. Recover the floor carpet under the brake pedal.

BRAKE PEDAL PLAY CHECK AND ADJUSTMENT

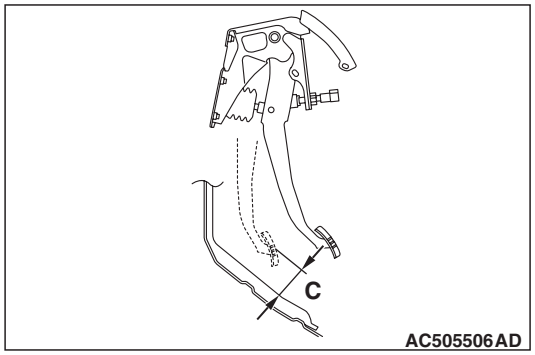


1. With the engine stopped, depress the brake pedal 2 or 3 times to release the vacuum in the brake booster. Then, press the brake pedal with your finger and check if the pedal stroke until the pedal becomes heavy (play) is within the standard value.

   Standard value (B): 3 –8 mm (0.12 –0.31 inch)

2. When the brake pedal play is not within the standard value, check the brake pedal-to-clevis pin looseness, clevis pin-to-booster operating rod looseness, brake pedal height, and stop lamp switch position, and adjust or replace as necessary.

BRAKE PEDAL-TO-FLOOR PANEL CLEARANCE CHECK AND ADJUSTMENT



1. Turn up the floor carpet under the brake pedal.
2. Start the engine and depress the brake pedal with approximately 500 N, and measure clearance between the brake pedal and the floor panel.

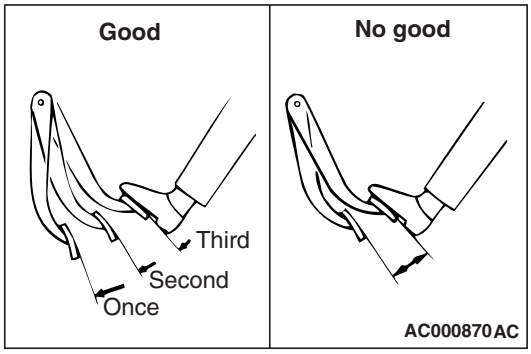
   Standard value (C): 85 mm (3.35 inch) or more

3. When the clearance is not within the standard value, check for air in the brake line and thickness of the disc brake pad, and correct or replace as necessary.
4. Recover the floor carpet under the brake pedal.

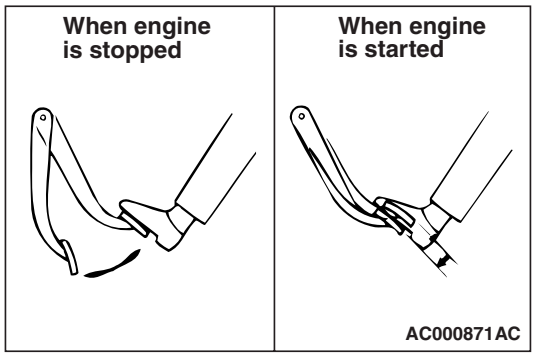
BRAKE BOOSTER OPERATION CHECK

M1351001000714

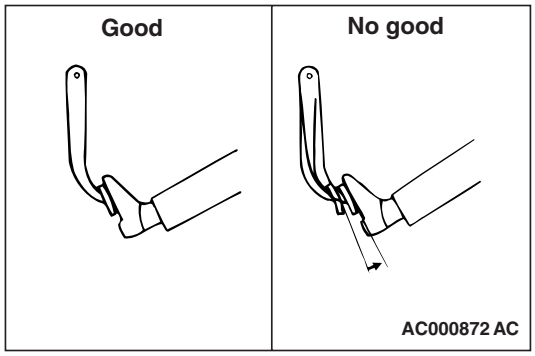
INSPECTION WITHOUT USING TESTER



1. Carry out the simplified brake booster operation check in the following procedure:
   (1) Run the engine for 1 to 2 minutes, and then stop. Depress the brake pedal with normal depression force. The result is judged as "Good" when the pedal stroke is great at the first depression, and becomes smaller as you repeat depressing the pedal. If the pedal stroke does not change, the result is judged as "No Good."



(2) With the engine stopped, depress the brake pedal several times. Keep the brake pedal depressed and start the engine. At this time, when the pedal moves down slightly, the result is judged as "Good." The result is judged as "No Good" if the pedal does not move down.

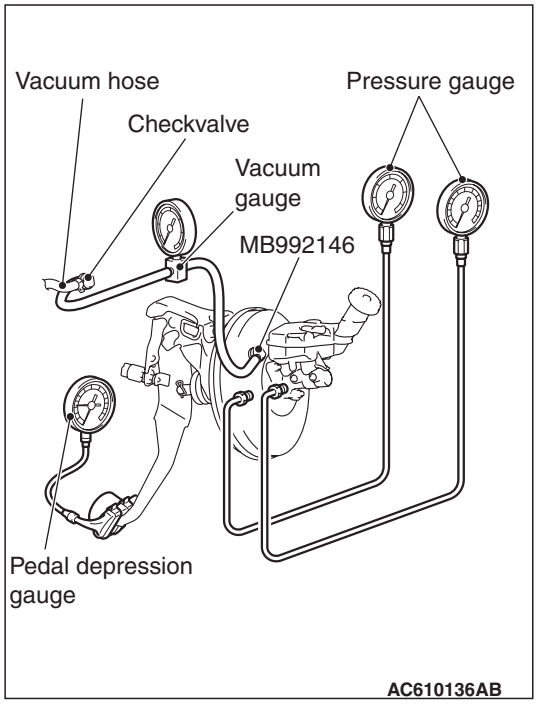


(3) With the engine running, depress the brake pedal. Stop the engine in this condition. The result is judged as "Good" when the pedal height does not change for approximately 30 seconds. The result is judged as "No Good" if the pedal moves up.

2. The brake booster is judged as normal when the results of all the above checks are "Good."
   When one or more of the above check results are "No Good," then the check valve, vacuum hose, or brake booster is suspected faulty.

INSPECTION USING SIMPLIFIED TESTER

1. Before starting this inspection, remove the brake booster check valve from the vehicle and check its operation.(Refer to P.35A-36.)
2. After checking, install the check valve to the vacuum hose and connect it to the vacuum gauge. Install the booster test adapter (Special tool: MB992146) to the brake booster and connect it to the vacuum gauge. Connect the pressure gauge and pedal depression gauge as shown in the figure. Bleed the pressure gauge and then perform the following tests:



(1) Airtightness test with no load
   Start the engine, and stop it when the vacuum gauge indicator has reached approximately −67 kPa (−9.7 psi). The result is judged as "Good" when the drop of the vacuum approximately 15 seconds after the engine was stopped is within −3.3 kPa (−0.5 psi).

(2) Airtightness test with load
   Start the engine and depress the brake pedal with 200 N. Stop the engine when the vacuum gauge indicator reached approximately −67 kPa (−9.7 psi). The result is judged as "Good" when the drop of the vacuum approximately 15 seconds after the engine was stopped is within −3.3 kPa (−0.5 psi).
   When one or more of the above check results are judged as "No Good," the vacuum hose or brake booster is suspected faulty.

(3) Brake booster characteristics test
   Perform this test after the above (1) and (2) were performed.

TSB Revision

a. Non-servo effect test
With the engine stopped, make sure that the vacuum gauge reading is 0 kPa (0 psi). Depress the brake pedal with 100 N (22.5 lb) and 300 N (67.4 lb), and measure the fluid pressure generated.

Standard value:
<Vehicles without ABS>

Item	**Pedal depression force**	
	100 N (22.5 lb)	**300 N (67.4 lb)**
Generated fluid pressure kPa (psi)	0 –600 (0 –87)	1,380 –2,220 (200 –322)

<Vehicles with ABS>

Item	**Pedal depression force**	
	100 N (22.5 lb)	**300 N (67.4 lb)**
Generated fluid pressure kPa (psi)	0 –590 (0 –85)	1,360 –2,180 (197 –316)

b. Servo effect test
Start the engine. Depress the brake pedal with 100 N (22.5 lb) and 300 N (67.4 lb) when the vacuum gauge indicator reached approximately –67 kPa (–9.7 psi), and measure the fluid pressure generated.

Standard value:
<Vehicles without ABS>

Item	**Pedal depression force**	
	100 N (22.5 lb)	**300 N (67.4 lb)**
Generated fluid pressure kPa (psi)	4,670 –5,910 (677 –857)	10,720 –11,560 (1,555 –1,676)

<Vehicles with ABS>

Item	**Pedal depression force**	
	100 N (22.5 lb)	**300 N (67.4 lb)**
Generated fluid pressure kPa (psi)	4,850 –6,460 (703 –937)	10,550 –11,380 (1,530 –1,650)

CHECK VALVE OPERATION CHECK

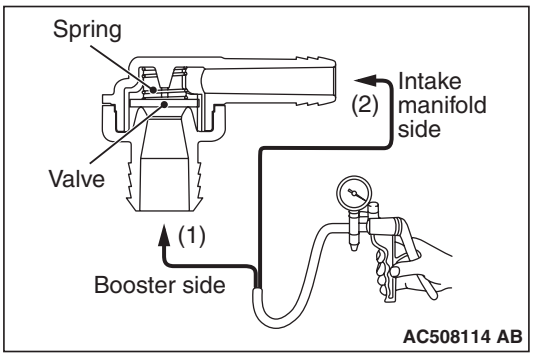
M1351009000730

1. Remove the check valve (Refer to P.35A-36).

⚠ CAUTION

Replace the check valve when it is faulty.

2. Using a vacuum pump, check operation of the check valve.



Vacuum pump connection	Normal condition
When connected to the booster side (1)	Vacuum is generated and maintained.
When connected to the engine side (2)	No vacuum is generated.

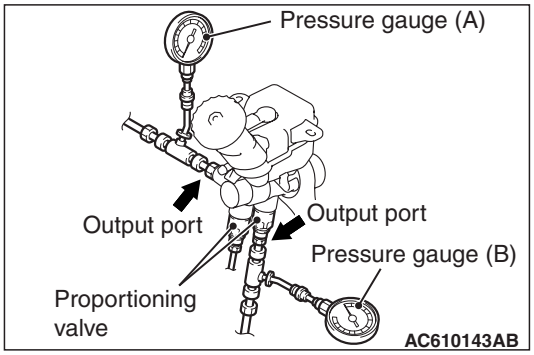
PROPORTIONING VALVE FUNCTION TEST <Vehicles without ABS>

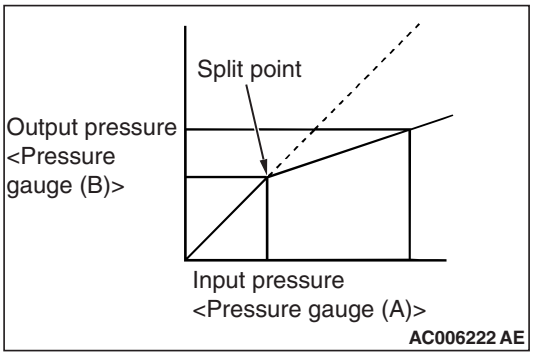
M1351001100539

⚠ CAUTION

The proportioning valves are installed independently for the right and left brake lines. Always measure each valve.

1. Connect two pressure gauges to the output port of the master cylinder and output port of the proportioning valve.
2. Bleed the brake line and the pressure gauges (Refer to P.35A-25).





3. Depress the brake pedal gradually. Then check that the split point, where the output fluid pressure begins to drop in proportion to the output fluid pressure, is at the standard value.

   Standard value:

   2.21 –2.70 (320 –391) <Vehicles with rear drum brake>

   1.81 –2.21 (262 –320) <Vehicles with rear disc brake>

4. Depress the brake pedal more strongly than at the above step. Then check that the output fluid pressure is at the standard value when the input fluid pressure is 6.86 MPa (996 psi).

   Standard value:

   3.29 –3.82 (477 –554) <Vehicles with rear drum brake>

   2.33 –3.46 (338 –501) <Vehicles with rear disc brake>

5. Measure each output fluid pressure at both valves, and check that the difference between the two is at the limit value or less.

TSB Revision

Limit: 0.5 MPa (73 psi)

6. If the measured pressure exceeds the limit, replace the proportioning valve.

BLEEDING

M1351001400927

⚠ CAUTION

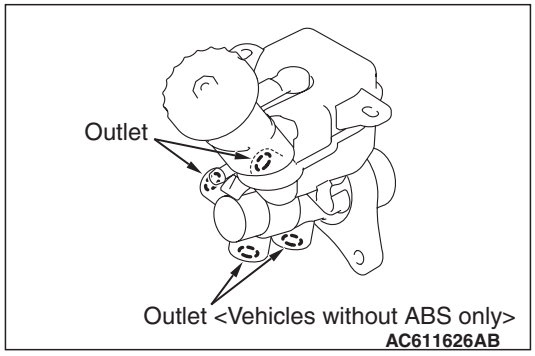
Be sure to use the specified brand and type of brake fluid. Avoid mixing with other type of brake fluid.

Brake fluid: DOT3 or DOT4

BLEEDING OF MASTER CYLINDER

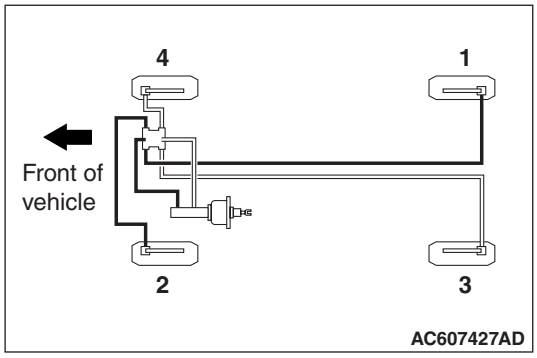
When removed the master cylinder assembly, bleed the master cylinder in the following procedure to make bleeding of the brake pipeline easier (When no brake fluid is in the master cylinder).

1. Fill the brake fluid reservoir with brake fluid.
2. Depress and hold the brake pedal.
3. Another operator closes the master cylinder outlets with his fingers.
4. In this condition, release the brake pedal.
5. Repeat Steps 2 to 4 for 3 or 4 times to fill the master cylinder with brake fluid.



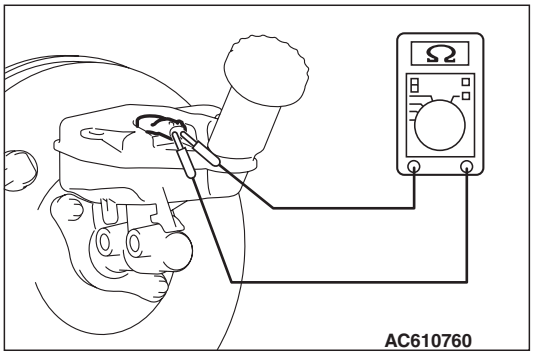
BLEEDING OF BRAKE PIPELINE

1. Perform the bleeding in the order shown in the figure.



BRAKE FLUID LEVEL SWITCH CHECK

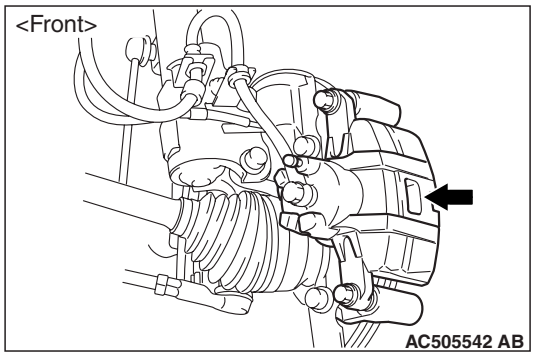
M1351009100726

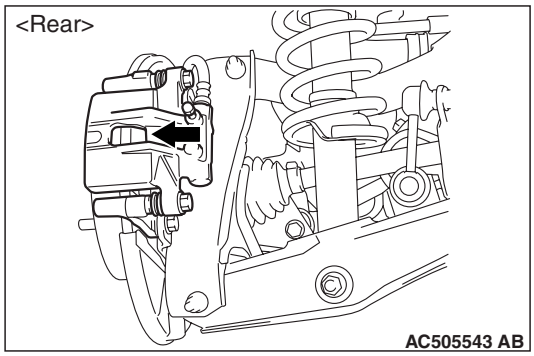


The brake fluid level switch is normal when the following conditions are met: When the brake fluid level is above "MIN," continuity is detected; and when the level is below "MIN," no continuity is detected.

INSPECTION/REPLACEMENT OF DISC BRAKE PAD

M1351002300967

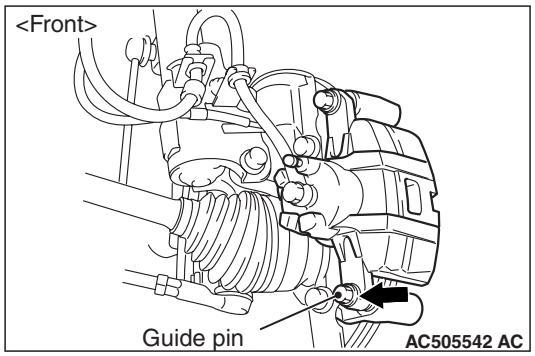


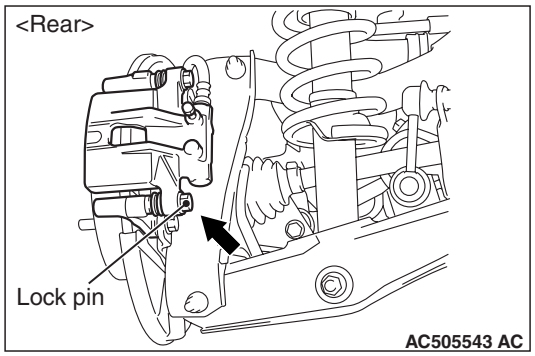


1. Visually check the thickness of brake pad from the inspection hole of the caliper body.

   Standard value: 10.0 mm (0.39 inch)
   Minimum limit: 2.0 mm (0.08 inch)

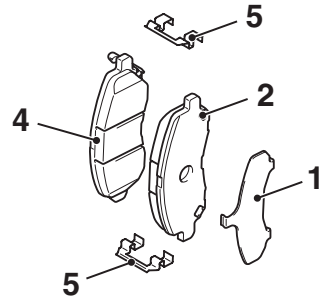
2. When the thickness is lower than the limit value, replace both brake pads (right and left) as a set.



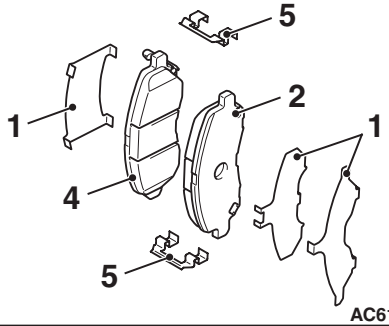


3. Remove the parts indicated in the figure, swivel the caliper assembly upward and retain it with a wire or similar tool.

<Front>
<Vehicles with 16-inch wheel>

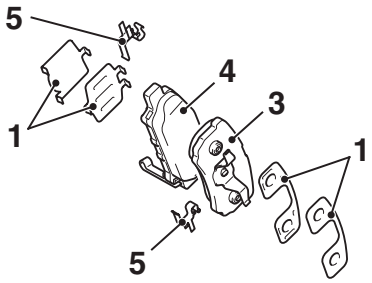


<Vehicles with 18-inch wheel>

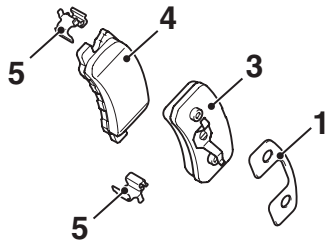


AC611992AB

<Rear>
<Vehicles with 16-inch wheel>



<Vehicles with 18-inch wheel>



AC611993AB

4. Remove the following parts from the caliper assembly.
   (1) Shim
   (2) Pad assembly <front>
   (3) Pad & clip assembly <rear>
   (4) Pad & wear indicator assembly
   (5) Clip
5. In order to measure the brake drag force after pad installation, measure the hub sliding torque with no pad attached (Refer to P.35A-39).
6. Install the pad and caliper assembly, and check the brake drag force (Refer to P.35A-39).

DISC BRAKE ROTOR CHECK

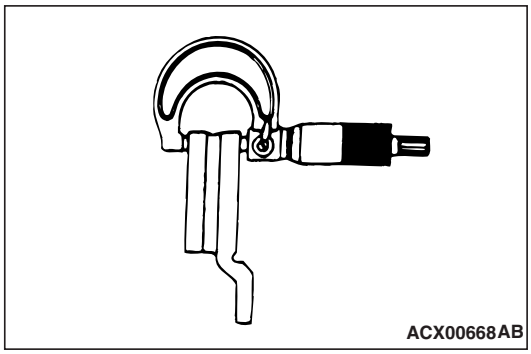
M1351002900657

⚠ CAUTION

Disc brakes must be kept within the allowable service values in order to maintain normal brake operation.

Before turning the brake disc, the following conditions should be checked.

Inspection items	Remarks
Scratches, rust, saturated lining materials and wear	• If the vehicle is not driven for a long period of time, sections of the discs that are not in contact with the pads will become rusty, causing noise and shuddering. • If grooves and scratches resulting from excessive disc wear are not removed prior to installing a new pad assembly, there will be inadequate contact between the disc and the lining (pad) until the pads conform to the disc.
Run-out	Excessive run-out of the discs will increase the pedal depression resistance due to piston kick-back.
Change in thickness (parallelism)	If the thickness of the disc changes, this will cause pedal pulsation, shuddering and surging.
Inset or warping (flatness)	Overheating and improper handling while servicing will cause warping or distortion.

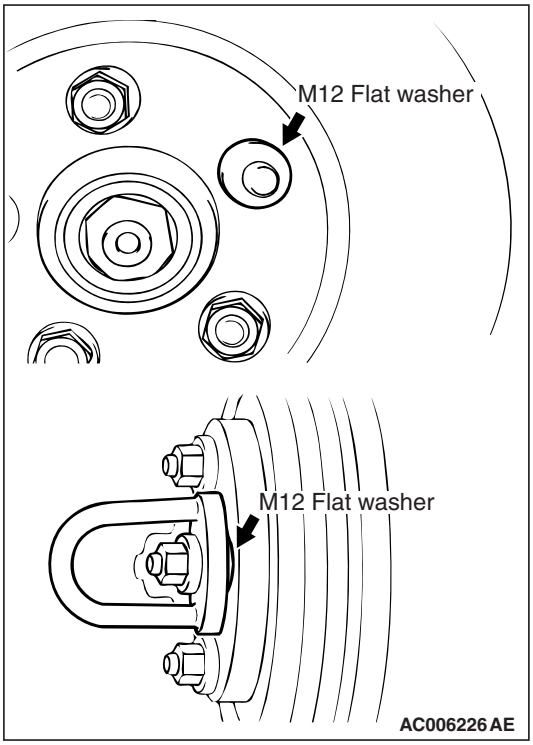


BRAKE DISC THICKNESS CHECK

1. Using a micrometer, measure disc thickness at eight positions, approximately 45 degrees apart and 10 mm (0.4 inch) in from the outer edge of the disc.

   Standard value:
   Front 26.0 mm (1.02 inch)
   Rear 10.0 mm (0.39 inch)
   Minimum limit:
   Front 24.4 mm (0.96 inch)
   Rear 8.4 mm (0.33 inch)

   NOTE: Thickness variation (at least 8 positions) should not be more than 0.015 mm (0.0006 inch).

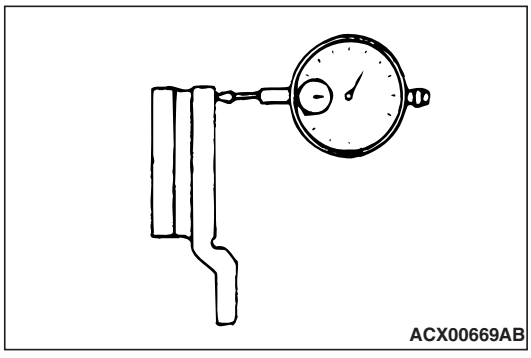


⚠ CAUTION

- **After a new brake disc is installed, always grind the brake disc with on-the-car type brake lathe.If this step is not carried out, the brake disc run-out exceeds the specified value, resulting in judder.**
- **When the on-the-car type lathe is used, first install M12 flat washer on the stud bolt in the brake disc side according to the figure, and then install the adapter. If the adapter is installed with M12 flat washer not seated, the brake disc rotor may be deformed, resulting in inaccurate grinding.**
- **Grind the brake disc with all wheel nuts diagonally and equally tightened to the specified torque 100 N· m (74 ft-lb). When all numbers of wheel nuts are not used, or the tightening torque is excessive or not equal, the brake disc rotor or drum may be deformed, resulting in judder.**

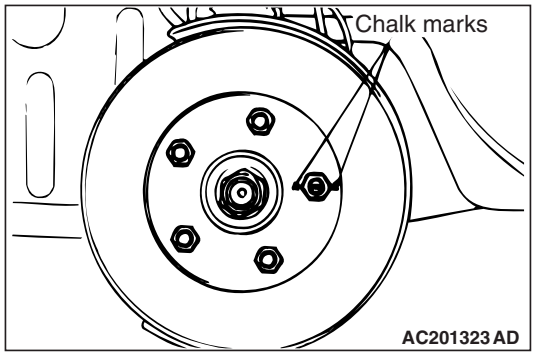
2. If the disc thickness is less than the limits, replace it with a new one. If thickness variation exceeds the specification, turn rotor with an on-the-car type brake lathe ("MAD, DL-8700PF" or equivalent). If the calculated final thickness after turning the rotor is less than the standard value, replace the disc.

FRONT BRAKE DISC RUN-OUT CHECK AND CORRECTION

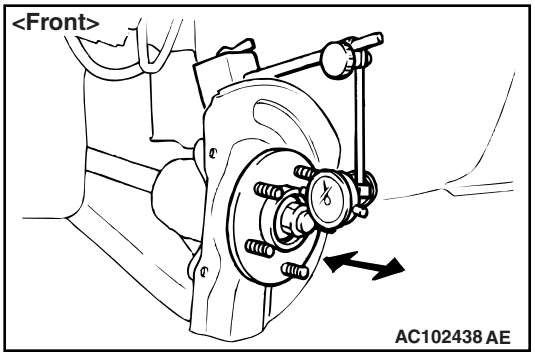


1. Remove the brake assembly, and then hold it with wire.
2. Temporarily install the disc with the hub nut.
3. Place a dial gauge approximately 5 mm (0.2 inch) from the outer circumference of the brake disc, and measure the run-out of the disc.

   Limit:
   0.06 mm (0.0024 inch) <Front>
   0.08 mm (0.0032 inch) <Rear>



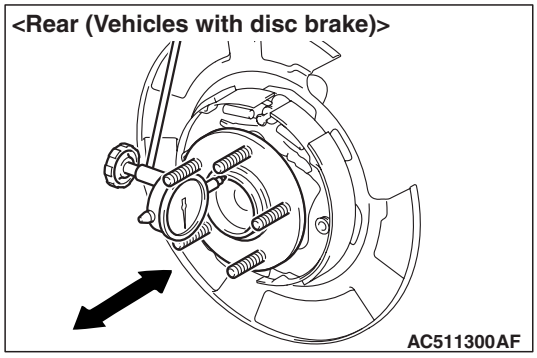
4. If the brake disc run-out exceeds the limit, correct it as follows:
   (1) Chalk phase marks on the wheel stud and the brake disc, which run-out is excessive as shown.



   (2) Remove the brake disc. Set a dial gauge as shown in the figure, and measure looseness of the hub in the axial direction.

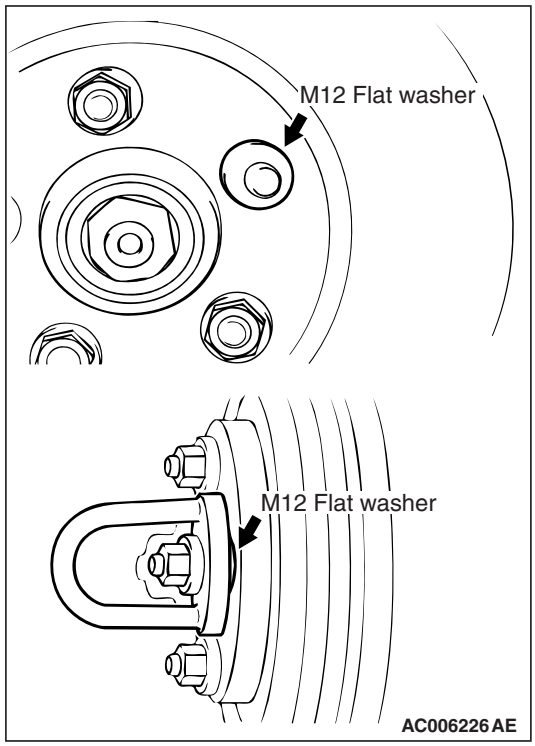
   Limit: 0.05 mm (0.002 inch)

   (3) When the looseness exceeds the limit value, replace the front or rear hub assembly.
   (4) When the looseness is within the limit value, install the brake disc after changing the phase between the hub and the brake disc, then check the runout of the brake disc again.



⚠ CAUTION

- **After a new brake disc is installed, always grind the brake disc with on-the-car type brake lathe. If this step is not carried out, the brake disc run-out exceeds the specified value, resulting in judder.**



- **When the on-the-car type lathe is used, first install M12 flat washer on the stud bolt in the brake disc side according to the figure, and then install the adapter. If the adapter is installed with M12 flat washer not seated, the brake disc rotor may be deformed, resulting in inaccurate grinding.**
- **Grind the brake disc with all wheel nuts diagonally and equally tightened to the specified torque 100 N· m (74 ft-lb). When all numbers of wheel nuts are not used, or the tightening torque is excessive or not equal, the brake disc rotor or drum may be deformed, resulting in judder.**

5. If the run-out cannot be corrected by changing the phase of the brake disc, replace the brake disc or grind it with the on-the-car type brake lathe ("MAD, DL-8700PF" or equivalent).

BRAKE LINING THICKNESS CHECK <Vehicles with rear drum brake>

M1351003000572

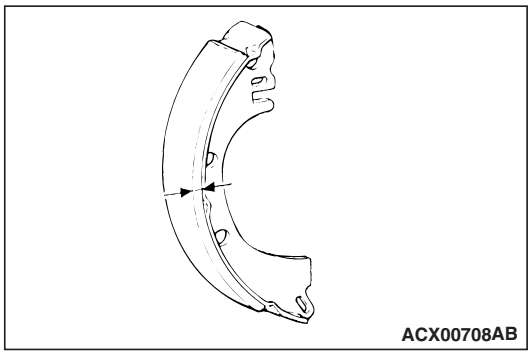
⚠ CAUTION

- **Whenever the shoe and lining assembly is replaced, replace both RH and LH assemblies as a set to prevent the car from pulling to one side when braking.**
- **If there is a significant difference in the thickness of the shoe and lining assemblies on the left and right sides, check the sliding condition of the piston.**

1. Remove the brake drum.
2. Measure the thickness of the brake lining at the area with the most wear.

   Standard value: 4.0 (0.16 inch)
   Minimum limit: 1.0 mm (0.04 inch)

3. Replace the shoe and lining assembly if the brake lining thickness is less than the limit or if it is not worn evenly. For installation procedures for the shoe and lining assembly, refer to P.35A-54.


ACX00708AB

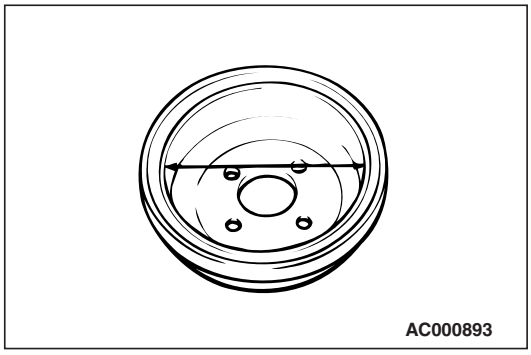
BRAKE DRUM INSIDE DIAMETER CHECK <Vehicles with rear drum brake>

M1351003200714

1. Remove the brake drum.
2. Measure the inside diameter of the brake drum at two or more locations.

   Standard value: 203 mm (8.0 inches)
   Limit: 205 mm (8.1 inches)

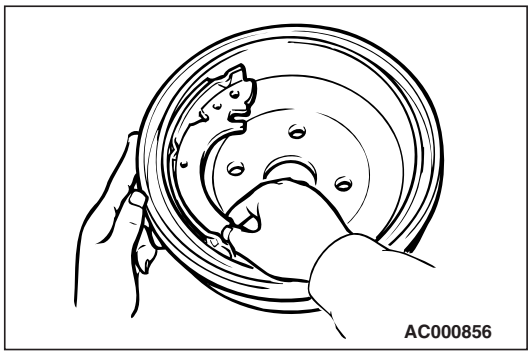
3. Replace the brake drums, shoe and lining assembly when wear exceeds the limit value or is badly imbalanced.


AC000893

BRAKE LINING AND BRAKE DRUM CONTACT CHECK <Vehicles with rear drum brake>

M1351003100546

1. Remove the brake drum.
2. Remove the shoe and lining assembly (Refer to P.35A-54).

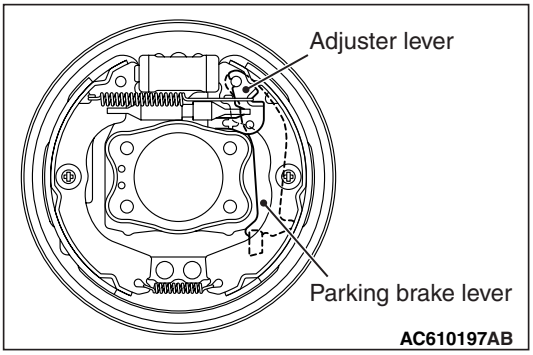

AC000856

3. Chalk the inner surface of the brake drum and rub with the shoe and lining assembly.
4. Replace the shoe and lining assembly or brake drums if there are any irregular contact areas.

   NOTE: Clean off chalk after check.

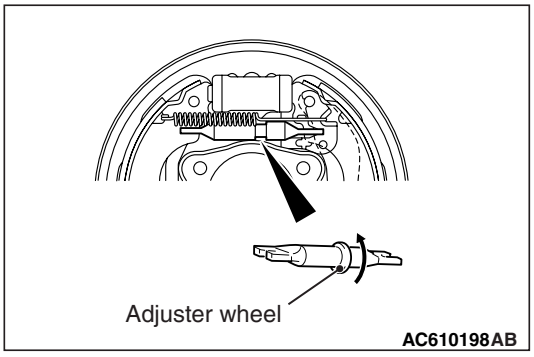
AUTO ADJUSTER FUNCTION CHECK <Vehicles with rear drum brake>

M1351010100333



AC610197AB

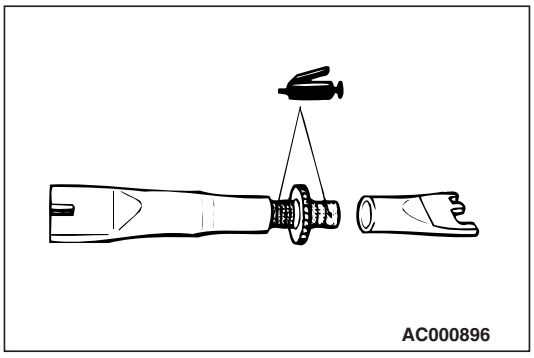
1. Remove the brake drum.
2. Operate the parking brake lever. Observe adjuster lever movement for ratcheting action of the auto adjuster. Repair or replace the lever(s) as required.
3. Remove the shoe-to-lever spring.



AC610198AB

4. Remove the adjuster.

   NOTE: It may be necessary to rotate the adjuster wheel bottom to top to release tension.
5. Inspect the adjuster wheel for wear, i.e., flat spots, worn teeth, etc. Replace if faulty.
6. Check both ends of the adjuster for smooth rotation. Replace if faulty.


AC000896

7. Apply Chuo Yuka AKB 100 or equivalent as shown.
8. To install adjuster, assemble the adjuster so it is at its minimum length and insert between shoe and lining assemblies.
9. Install adjuster lever and shoe-to-lever spring.
10. Rotate the adjuster wheel top to bottom until the drum has a slight drag when the drum is installed.

MASTER CYLINDER FUNCTION CHECK

M1351010200330

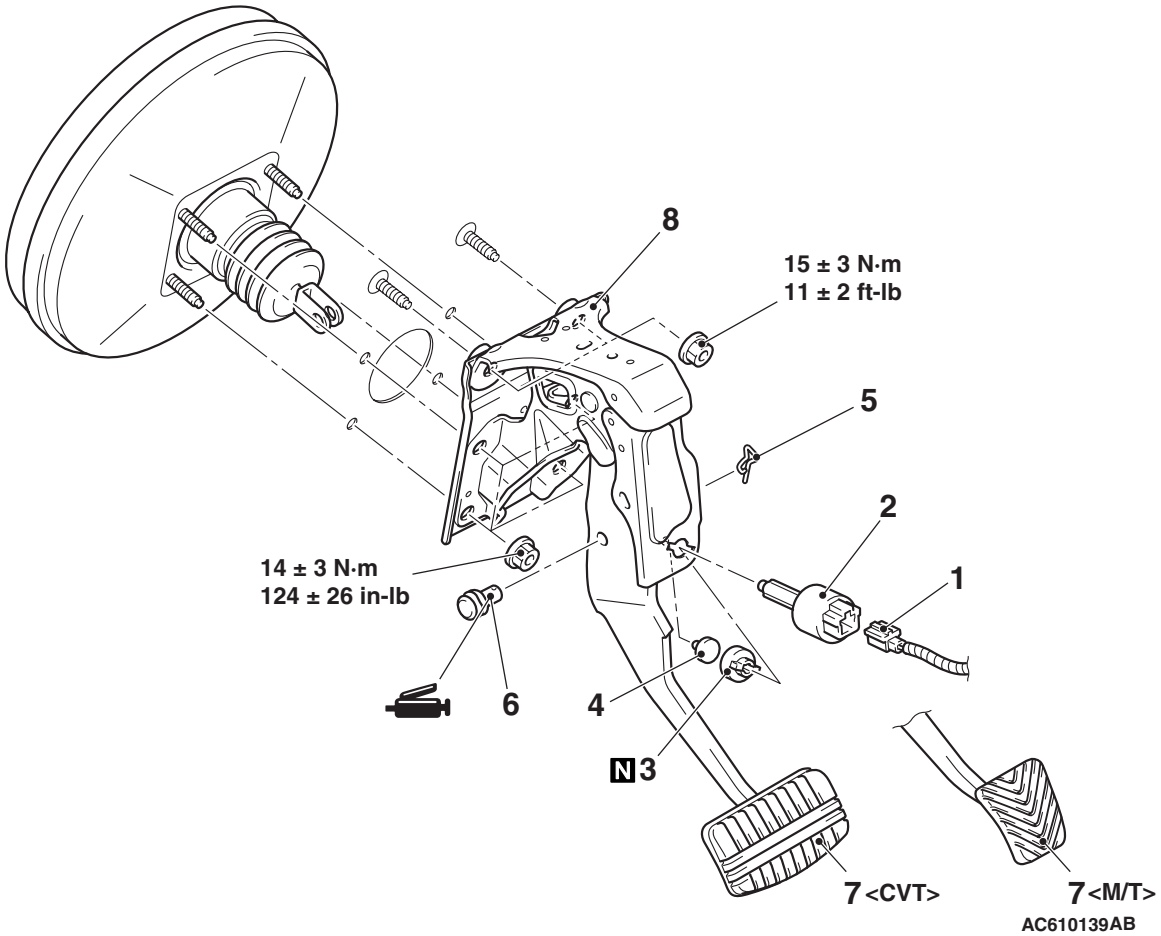
1. Remove the reservoir cap.
2. While watching the open reservoir from a distance of 50 cm (20 inches), have an assistant depress the brake pedal. If there was a stream of brake fluid rising from the reservoir, proceed to Step 3. If there was no stream of brake fluid rising from the reservoir, replace the master cylinder.
3. While watching the open reservoir from a distance of 50 cm (20 inches), have the assistant release the brake pedal. If there was a small amount of air bubbles rising through the brake fluid, master cylinder function is normal. If there were no bubbles rising through the brake fluid, replace the master cylinder.

BRAKE PEDAL

REMOVAL AND INSTALLATION

M1351003400989

Pre-removal and Post-installation operation
Knee Air Bag Module Removal and Installation (Refer to GROUP 52B –Knee Air Bag Module P.52B-378).



Removal steps
1. Harness connector
2. Stop lamp switch
3. Pedal clip
4. Pedal stopper

Removal steps (Continued)
>>A<< 5. Snap pin
6. Pin assembly
7. Pedal pad
8. Brake pedal assembly

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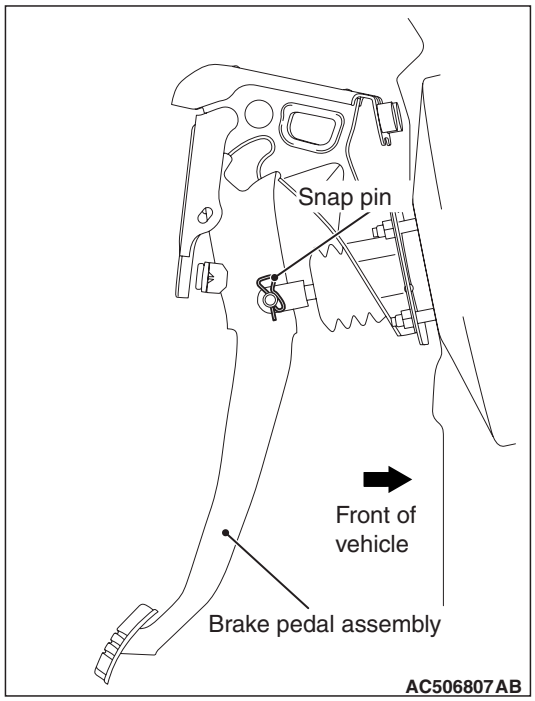
INSTALLATION SERVICE POINT

>>A<< SNAP PIN INSTALLATION

1. Install the snap pin as shown in the figure.

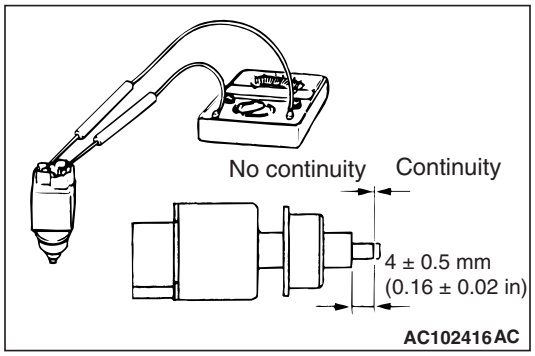


INSPECTION

CHECK THE STOP LAMP SWITCH CONTINUITY.

M1351008900309

1. Connect a circuit tester (Ωrange) to the stop lamp switch connector.
2. When no continuity is detected with the plunger pressed from the edge of the outer case by the dimension shown in the figure and when continuity is detected with the plunger released, the stop lamp switch is in good condition.



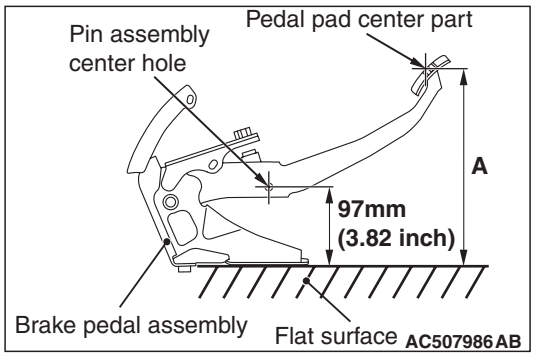
BRAKE PEDAL DISTORTION CHECK

M1351016300090

1. Place the brake pedal assembly on a level surface as shown in the figure, and set the distance from the center of the pin assembly mounting hole to the level surface to 97 mm (3.82 inch). Make sure that the dimension A in the figure (distance from the pedal pad center part to the level surface) is within the standard value.

   Standard value (A):
   237 –245 mm (9.3 –9.6 inch) <M/T>
   240 –248 mm (9.4 –9.8 inch) <CVT>

2. When dimension A is not within the standard value, replace the brake pedal assembly.



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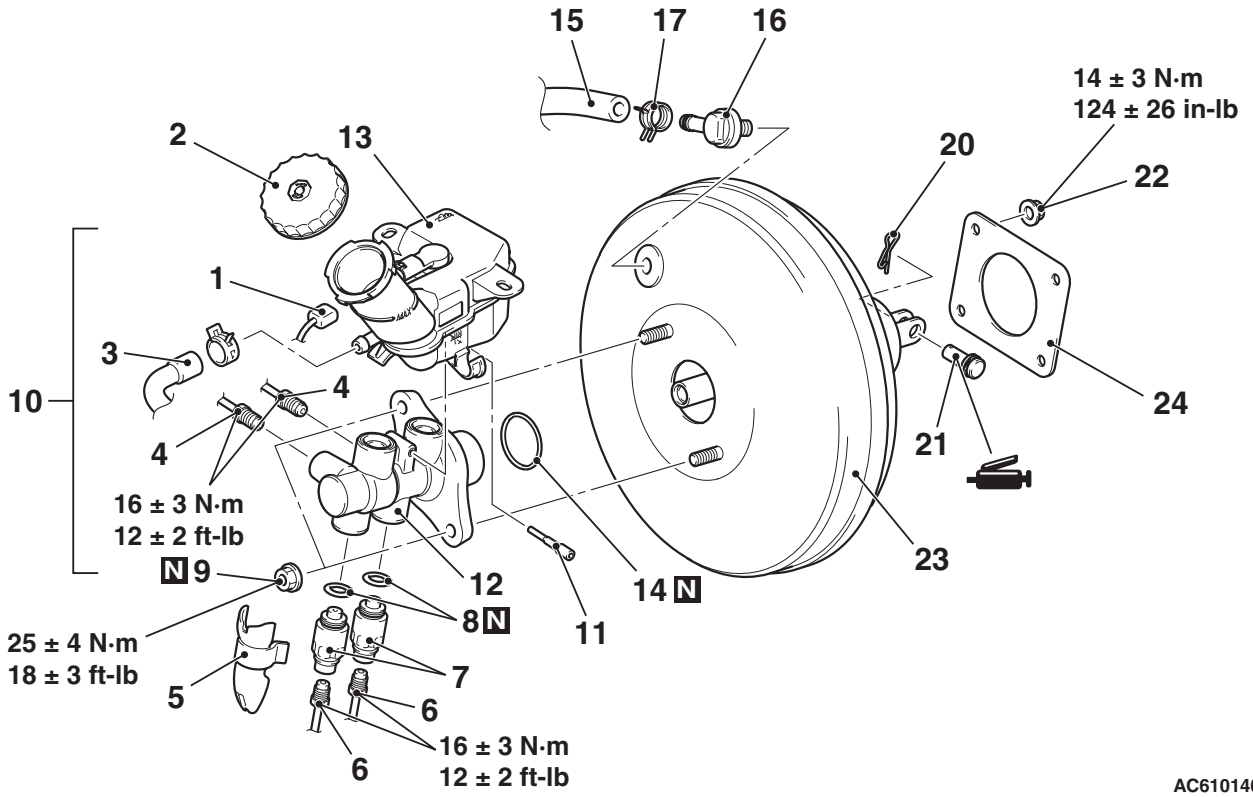
MASTER CYLINDER ASSEMBLY AND BRAKE BOOSTER

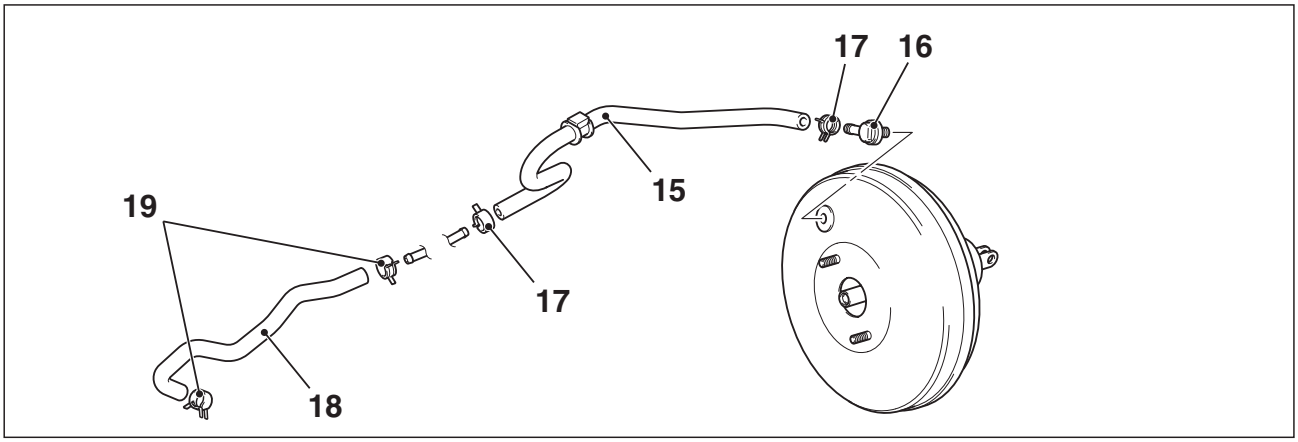
REMOVAL AND INSTALLATION

M1351003701303

Pre-removal operation	Post-installation operation
• Brake fluid draining • Air Cleaner Cover Removal (Refer to GROUP 15 –Air Cleaner P.15-4).	• Air Cleaner Cover Installation (Refer to GROUP 15 –Air Cleaner P.15-4). • Brake fluid refilling and air bleeding (Refer to P.35A-25).



AC610140AB



Removal steps

1. Brake fluid level switch connector
2. Reservoir cap
3. Reservoir hose connection
4. Brake pipe connection
5. Protector <Vehicles without ABS>
6. Brake pipe connection <Vehicles without ABS>
7. Proportioning valve <Vehicles without ABS>
8. O-ring <Vehicles without ABS>

Removal steps (Continued)

9. Master cylinder mounting nuts
10. Reservoir assembly and master cylinder assembly
11. Torx bolt
12. Master cylinder assembly
13. Reservoir assembly
14. O-ring

>>B<< 15. Vacuum hose

>>B<< 16. Check valve

17. Hose clip

>>B<< 18. Vacuum hose

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Removal steps (Continued)

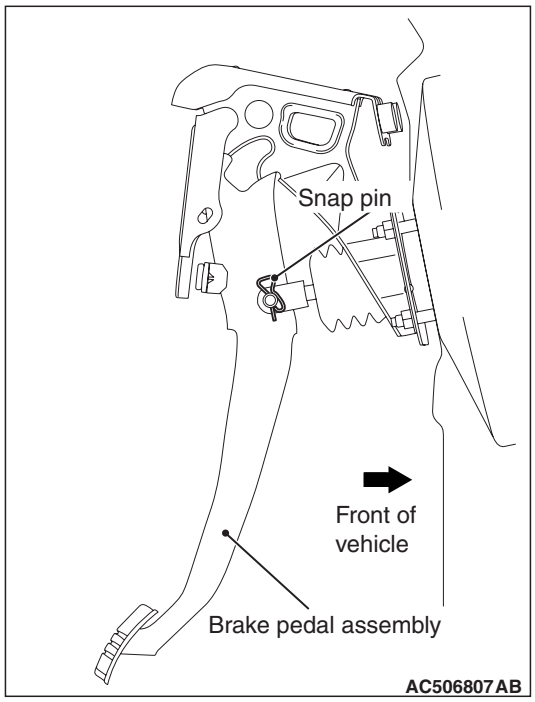
19. Hose clip
>>A<< 20. Snap pin
21. Pin assembly
22. Brake booster mounting nut
- Cowl top panel (Refer to GROUP 42, Loose panel P.42A-221.)
- Strut tower bar (Refer to GROUP 42, Strut tower bar P.42A-11.)

23. Brake booster assembly
24. Seal

INSTALLATION SERVICE POINTS

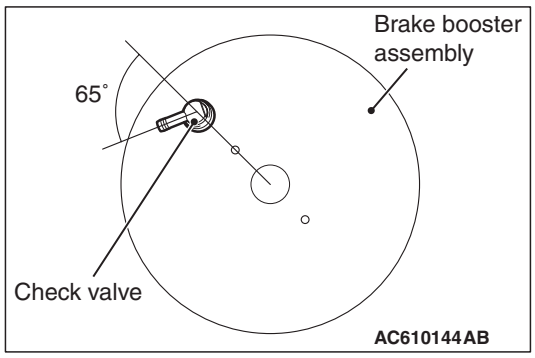
>>A<< SNAP PIN INSTALLATION

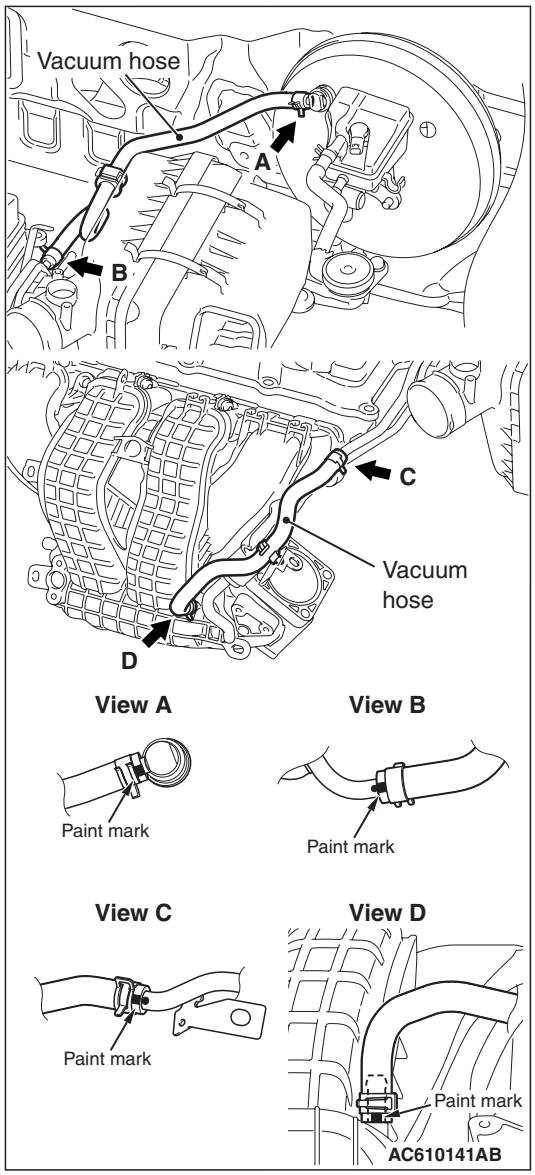
1. Install the snap pin as shown in the figure.



>>B<< CHECK VALVE AND VACUUM HOSE INSTALLATION

1. Install the check valve to the brake booster as shown in the figure.





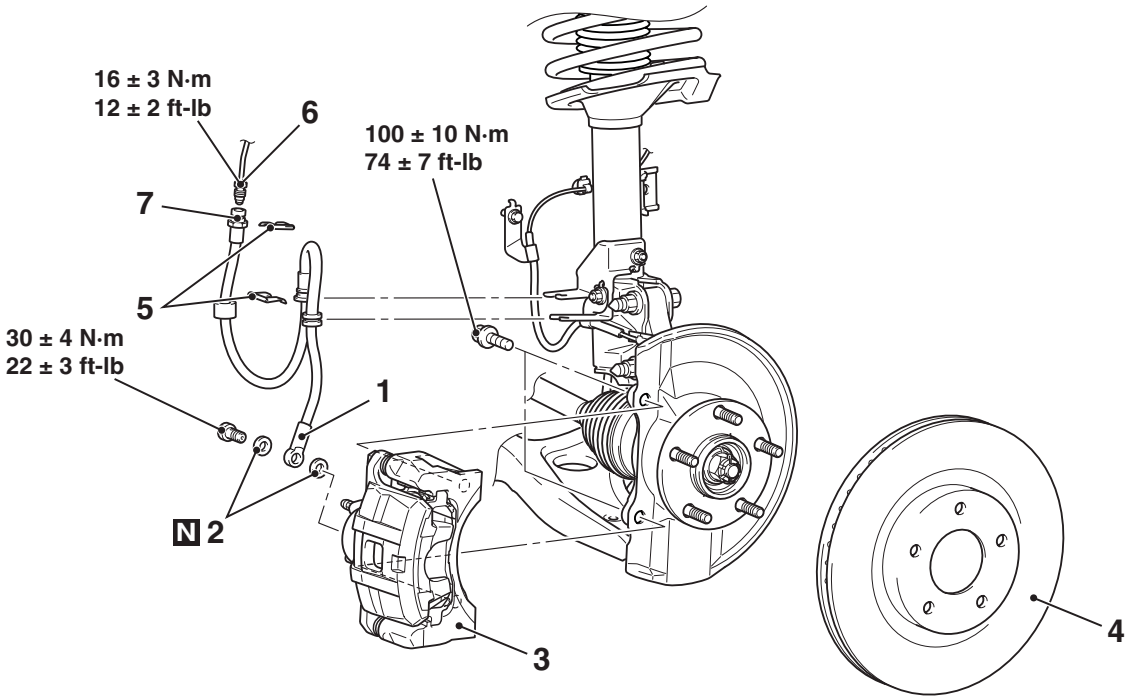
2. Align the mark as shown in the figure to assemble the vacuum hose.

FRONT DISC BRAKE ASSEMBLY

REMOVAL AND INSTALLATION

M1351006001068

Pre-removal operation	Post-installation operation
Brake fluid draining	Brake fluid refilling and air bleeding (Refer to P.35A-25).



AC610142AB

Removal steps

1. Brake hose (brake caliper side) connection
2. Gasket

>>B<< 3. Brake caliper assembly

4. Front brake disc

Removal steps (Continued)

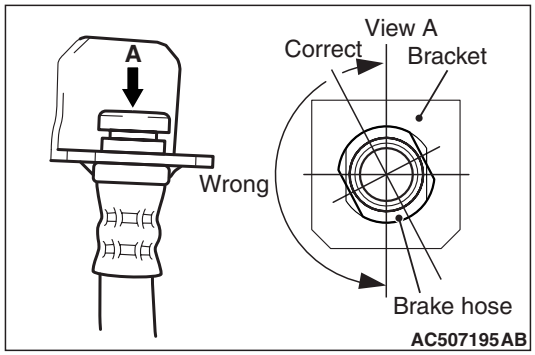
5. Clip
6. Brake pipe

>>A<< 7. Brake hose (brake pipe side) connection

INSTALLATION SERVICE POINTS

>>A<< BRAKE HOSE INSTALLATION

1. Pass the brake hose through the hole in the body-side bracket.
2. Install the brake hose to the brake caliper.
3. Install the brake hose at the two fixing points.
4. Twist the brake hose toward the lesser torsion between the brake hose and body-side bracket as shown in the figure, and fix it to the body-side bracket with a clip.



AC507195AB

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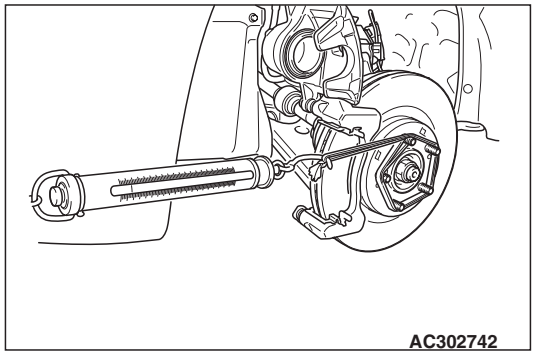
>>B<< BRAKE CALIPER ASSEMBLY INSTALLATION

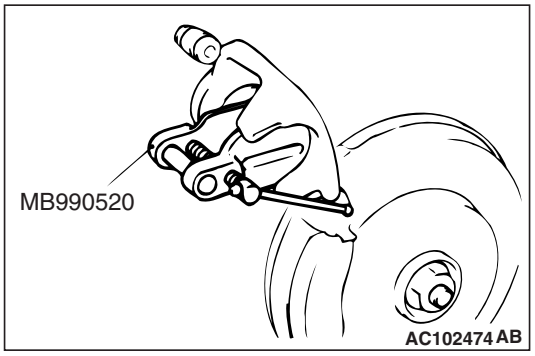

AC302742

Measure the brake drag force in the following procedure:

1. Using a spring scale, measure the hub sliding torque in the forward direction.

⚠ CAUTION

Keep grease or other soiling off the pad and brake disc friction surfaces.

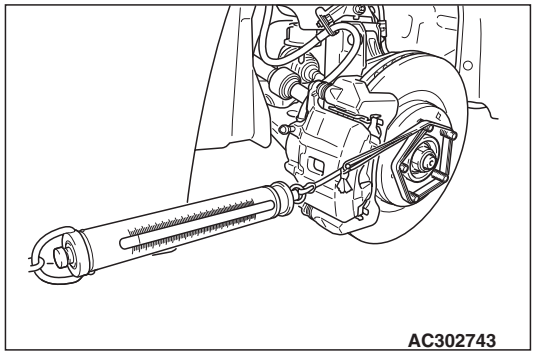


AC102474AB

2. Clean the piston, and press the piston into the cylinder using the piston expander (Special tool: MB990520).
3. Assemble the pad clip and pad to the caliper support, and tighten the guide pin to the specified torque.

   Tightening torque: 44 ±5 N· m (32 ±4 ft-lb)

4. Start the engine, and depress the brake pedal forcibly two or three times. Then, stop the engine.
5. Turn the brake disc 10 times in the forward direction.


AC302743

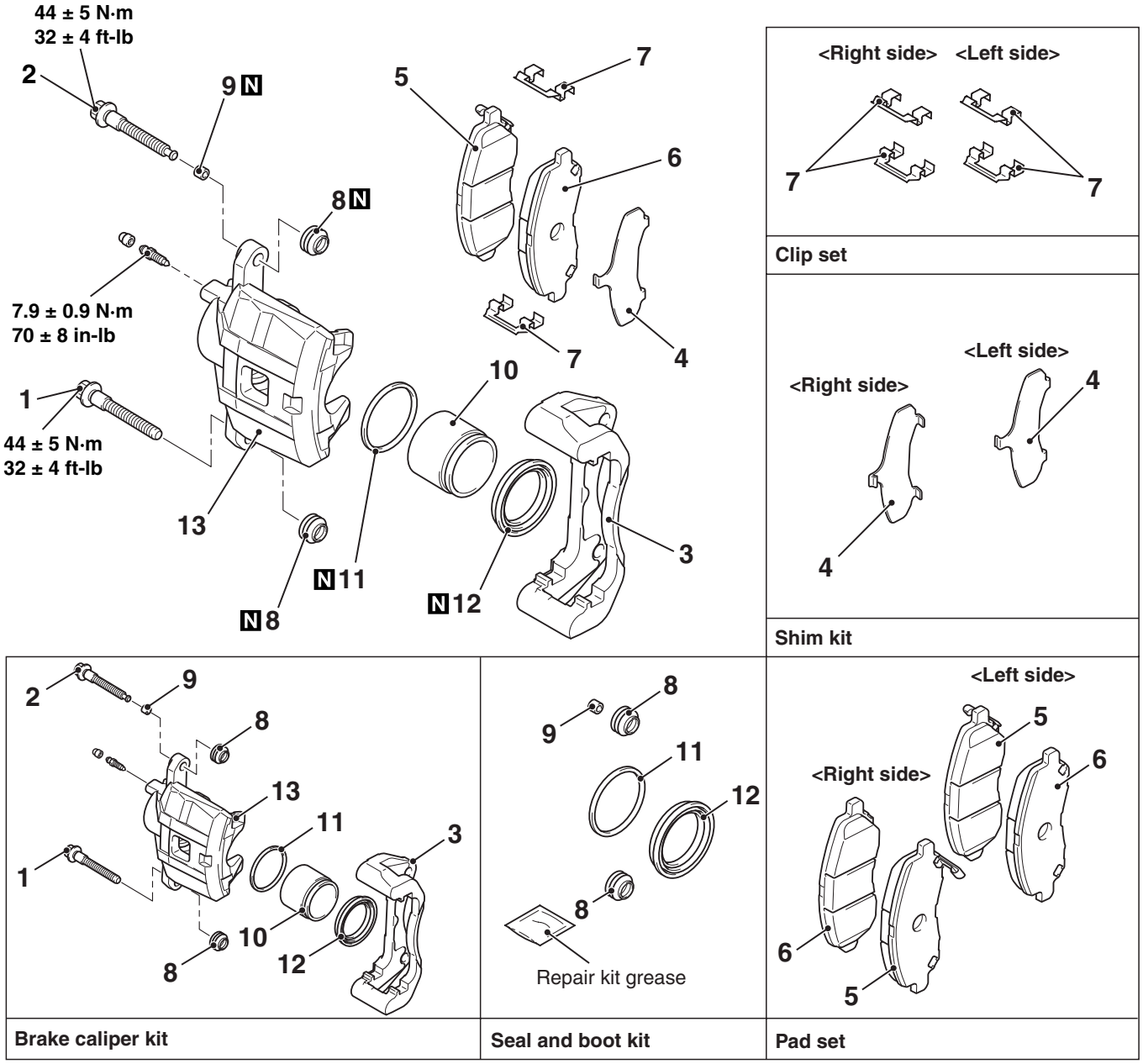
6. Using a spring scale, measure the hub sliding torque in the forward direction.
7. Obtain the disc brake drag force (difference between measured values of item 1 and item 6).

   Standard value: 68 N (15.3 pounds) or less

8. If the brake drag force exceeds the standard value, disassemble the piston to check for fouling/rust on the piston sliding section and piston/seal deterioration, and confirm whether the slide pin slides properly.

DISASSEMBLY AND ASSEMBLY <Vehicles with 16-inch wheel>

M1351006201192



AC611959AB

Disassembly steps

1. Guide pin
2. Lock pin
3. Caliper support (including pad, clip, and shim) **<<A>>**
4. Shim **<<B>>**
5. Pad & wear indicator assembly **<<A>>**
6. Pad assembly

Disassembly steps (Continued)

7. Clip
8. Pin boot
9. Bushing
10. Piston
11. Piston seal
12. Piston boot
13. Caliper body

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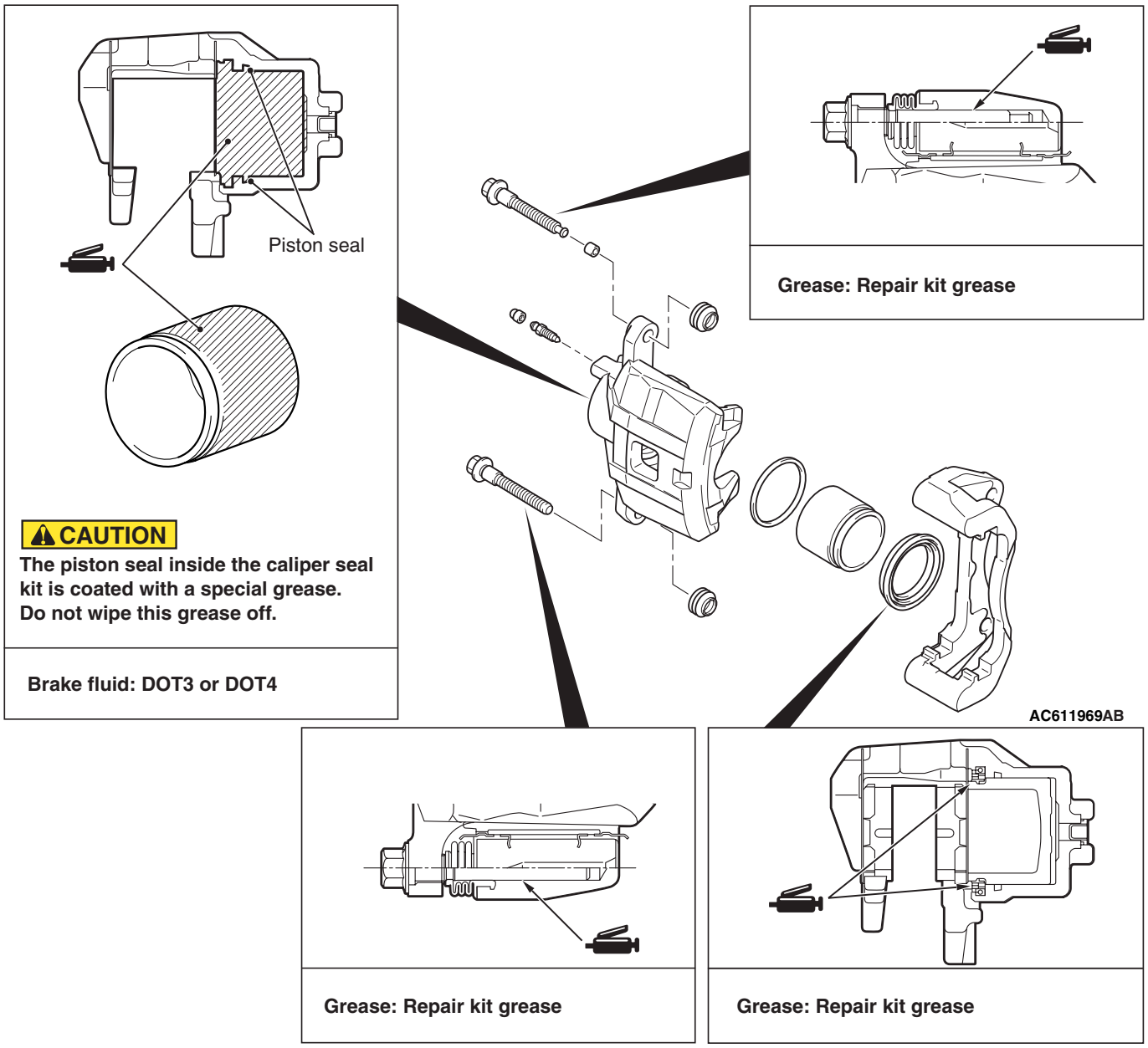
LUBRICATION POINTS


Piston seal
Grease: Repair kit grease
CAUTION
The piston seal inside the caliper seal kit is coated with a special grease. Do not wipe this grease off.
Brake fluid: DOT3 or DOT4
AC611969AB
Grease: Repair kit grease
Grease: Repair kit grease

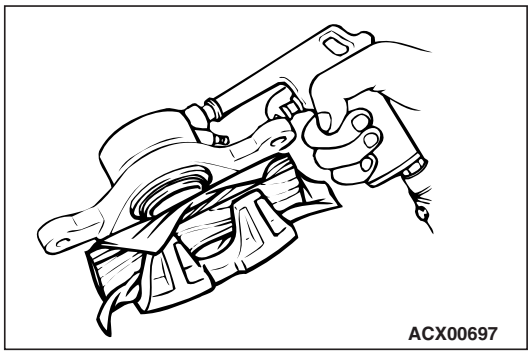
DISASSEMBLY SERVICE POINTS

<<A>> PISTON BOOT/PISTON REMOVAL

⚠ CAUTION

Blow air gradually to remove the pistons. The pistons will rush out if a force of air is applied suddenly.

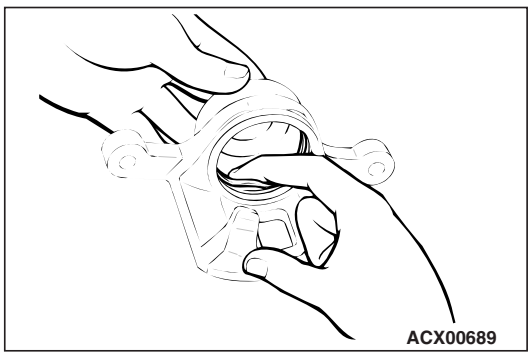
Cover the caliper body outer side with a cloth or similar materials. Blow compressed air through the brake hose installation area to remove the piston and piston boot.



<<B>> PISTON SEAL REMOVAL

⚠ CAUTION

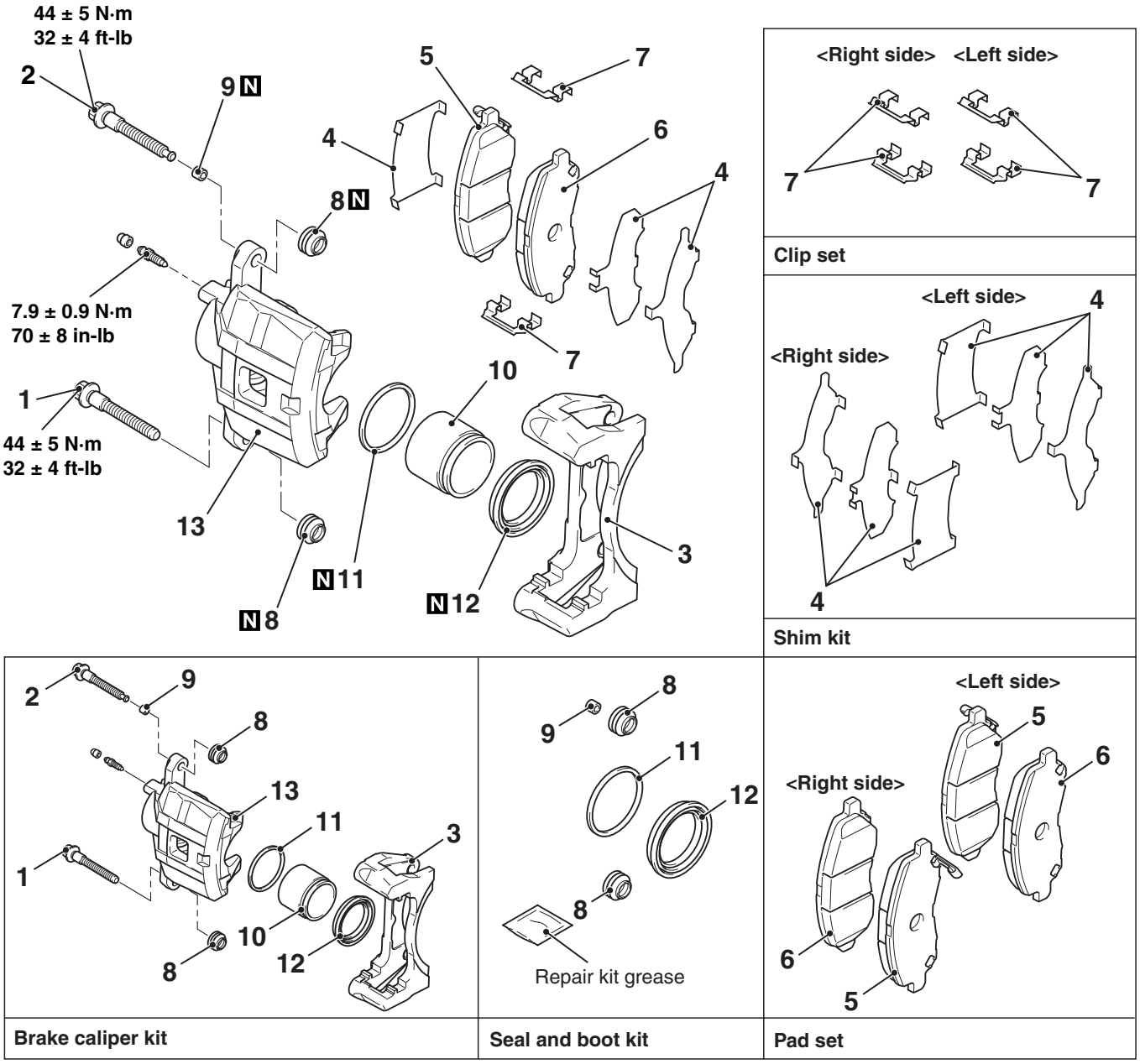
Do not use a flat-tipped screwdriver to remove the piston seal. This may damage the inner side of the cylinder.



1. Remove the piston seal with your finger tip.
2. Clean the piston surface and cylinder inner face with alcohol or specified brake fluid.
   Brake fluid: DOT3 or DOT4

DISASSEMBLY AND ASSEMBLY <Vehicles with 18-inch wheel>

M1351006201169



AC611009AE

Disassembly steps

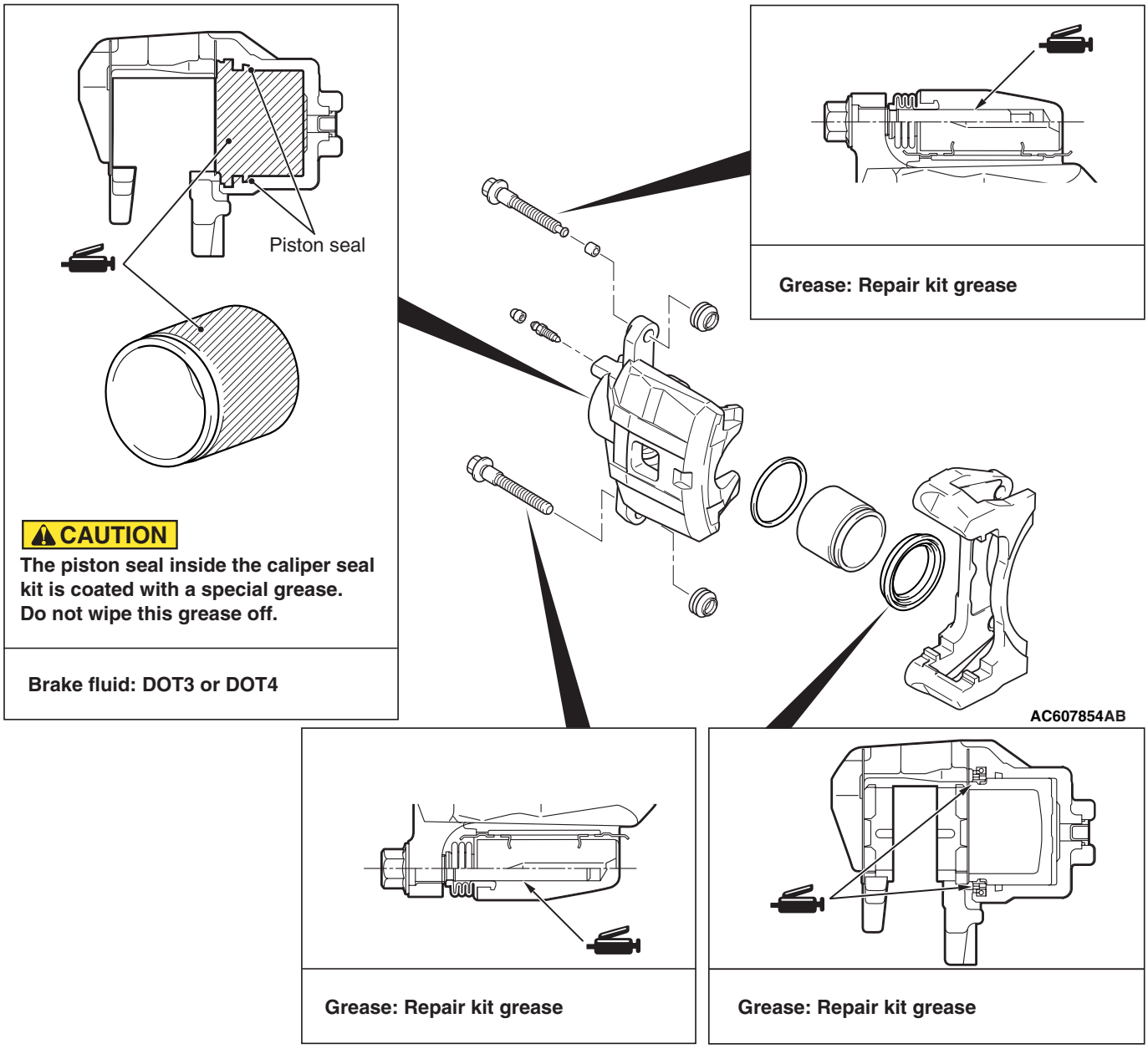
1. Guide pin
2. Lock pin
3. Caliper support (including pad, clip, and shim) **<<A>>**
4. Shim **<<B>>**
5. Pad & wear indicator assembly **<<A>>**
6. Pad assembly

Disassembly steps (Continued)

7. Clip
8. Pin boot
9. Bushing
10. Piston
11. Piston seal
12. Piston boot
13. Caliper body

TSB Revision

LUBRICATION POINTS


Piston seal
CAUTION
The piston seal inside the caliper seal kit is coated with a special grease. Do not wipe this grease off.
Brake fluid: DOT3 or DOT4
Grease: Repair kit grease
AC607854AB
Grease: Repair kit grease
Grease: Repair kit grease

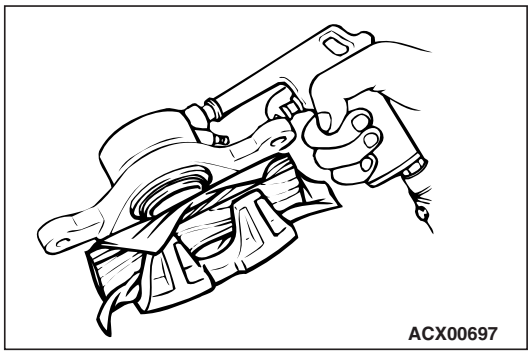
DISASSEMBLY SERVICE POINTS

<<A>> PISTON BOOT/PISTON REMOVAL

⚠ CAUTION

Blow air gradually to remove the pistons. The pistons will rush out if a force of air is applied suddenly.

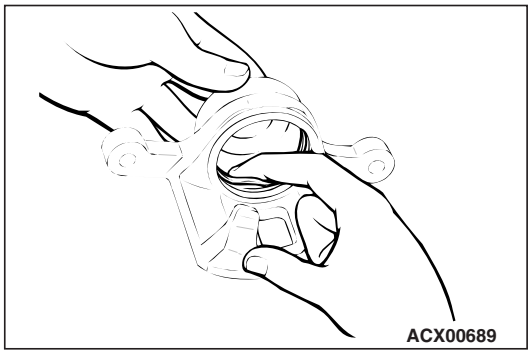
Cover the caliper body outer side with a cloth or similar materials. Blow compressed air through the brake hose installation area to remove the piston and piston boot.


ACX00697

<<B>> PISTON SEAL REMOVAL

⚠ CAUTION

Do not use a flat-tipped screwdriver to remove the piston seal. This may damage the inner side of the cylinder.


ACX00689

1. Remove the piston seal with your finger tip.
2. Clean the piston surface and cylinder inner face with alcohol or specified brake fluid.

   Brake fluid: DOT3 or DOT4

INSPECTION

M1351015000331

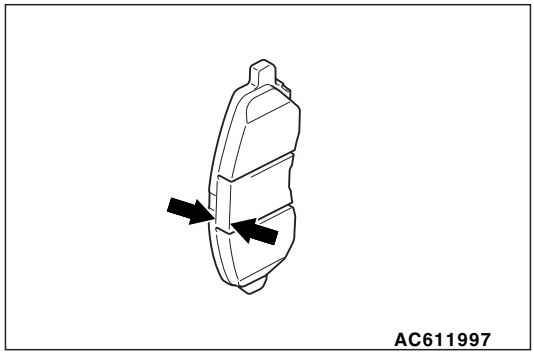
PAD WEAR INSPECTION

⚠ CAUTION

- **When replacing, replace both pads (right and left) as a set.**
- **If there is a significant difference in thickness between the pads at right and left, check the sliding area of the brake caliper.**

Measure the pad thickness at the most worn area. If the pad thickness is less than the limit value, replace the pad.

Standard value: 10.0 mm (0.39 inch)
Minimum limit: 2.0 mm (0.08 inch)

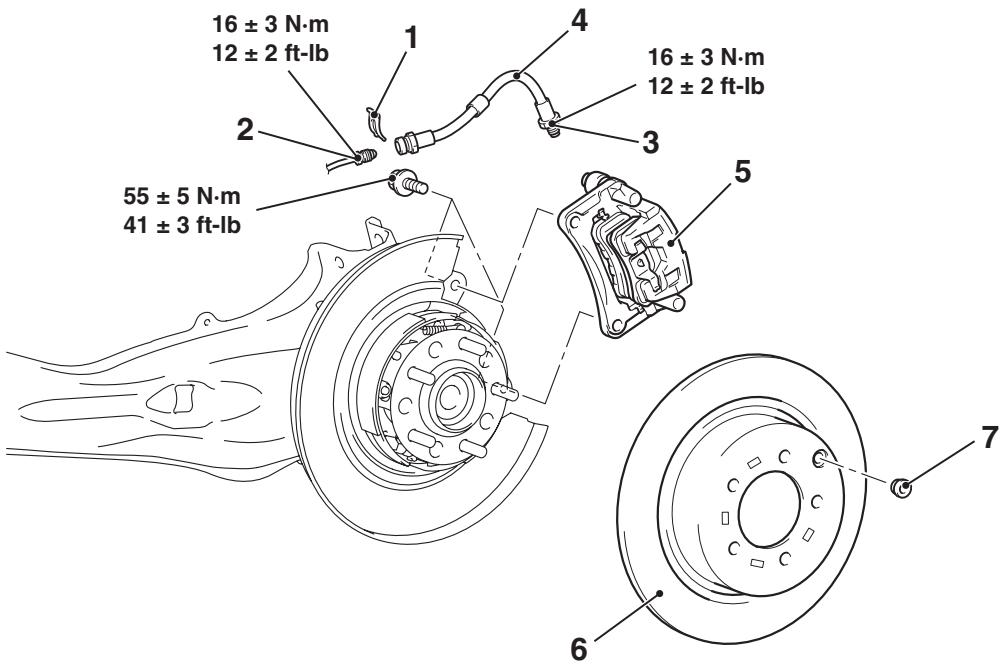

AC611997

REAR DISC BRAKE ASSEMBLY <Vehicles with rear disc brake>

REMOVAL AND INSTALLATION

M1351007000693

Pre-removal operation	Post-installation operation
Brake fluid draining	Brake fluid refilling and air bleeding (Refer to P.35A-25).



AC610145AB

Removal steps
1. Clip
2. Connection between brake pipe and brake hose
3. Connection between brake hose and rear brake caliper assembly

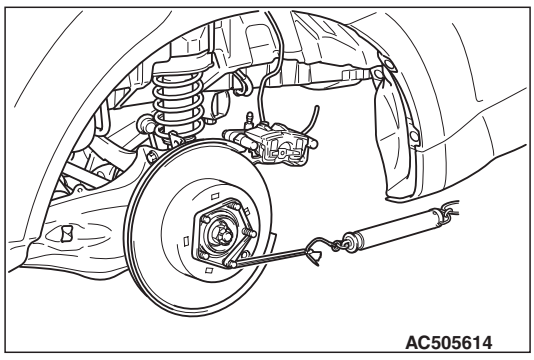
Removal steps (Continued)
4. Brake hose
>>A<< 5. Rear brake caliper assembly
6. Rear brake disc
7. Plug

INSTALLATION SERVICE POINTS

>>A<< REAR BRAKE CALIPER ASSEMBLY INSTALLATION

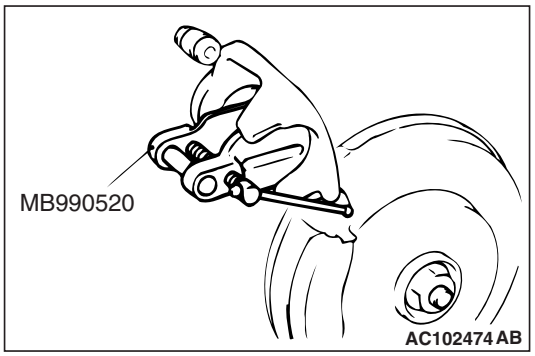
Measure the brake drag force in the following procedure:

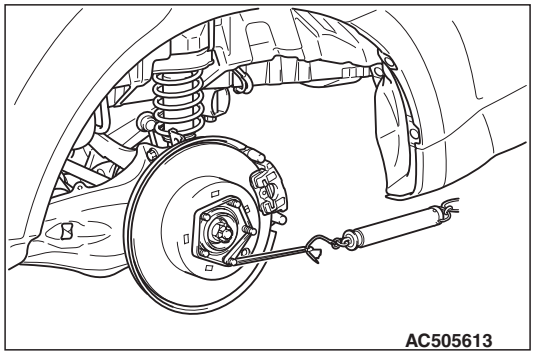
1. Using a spring scale, measure the hub sliding torque in the forward direction.



AC505614

TSB Revision





⚠ CAUTION

Keep grease or other soiling off the pad and brake disc friction surfaces.

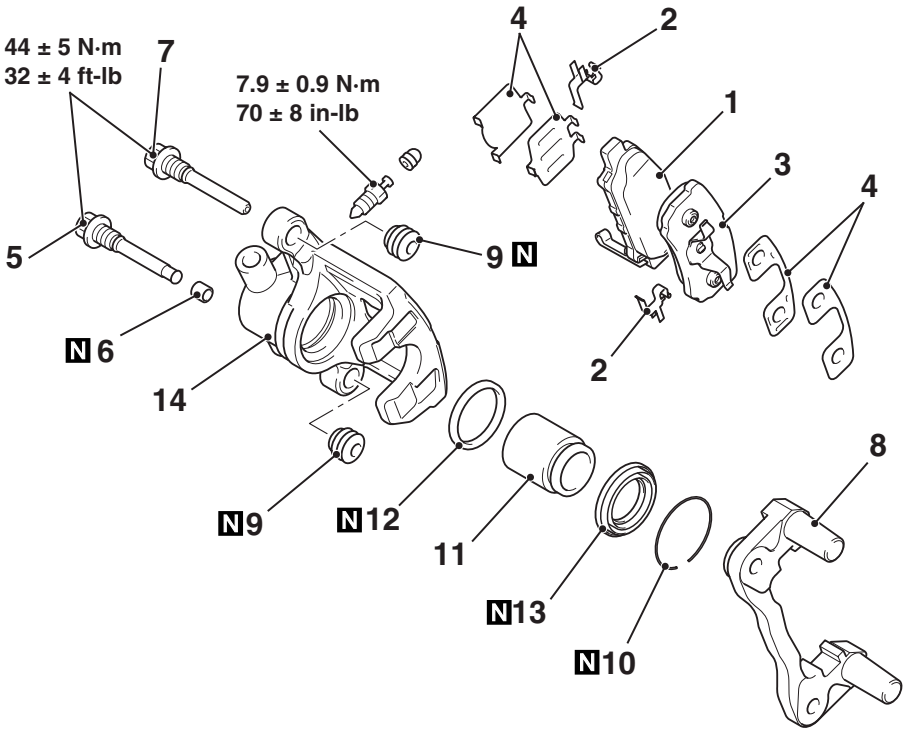
2. Clean the piston, and press the piston into the cylinder using the piston expander (Special tool: MB990520).
3. Install the caliper support to the backing plate assembly, and assemble the pad clip and pad to the caliper support.
4. Lower the caliper assembly with care not to catch the piston boot, and tighten the lock pin to the specified torque.

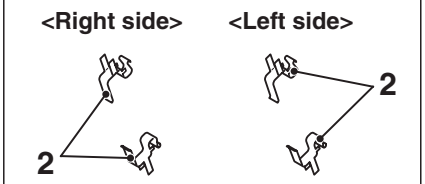
   Tightening torque: 44 ±5 N· m (32 ±4 ft-lb)
5. Start the engine, and depress the brake pedal forcibly two or three times. Then, stop the engine.
6. Turn the brake disc 10 times in the forward direction.
7. Using a spring scale, measure the hub sliding torque in the forward direction.
8. Obtain the disc brake drag force (difference between measured values of item 1 and item 7).

   Standard value: 68 N (15.3 pounds) or less
9. If the brake drag force exceeds the standard value, disassemble the piston to check for fouling/rust on the piston sliding section and piston/seal deterioration, and confirm whether the slide pin slides properly.

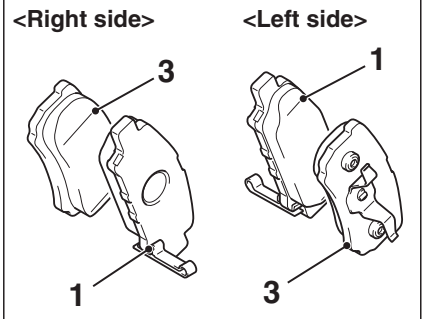
DISASSEMBLY AND ASSEMBLY <Vehicles with 16-inch wheel>

M1351007200738

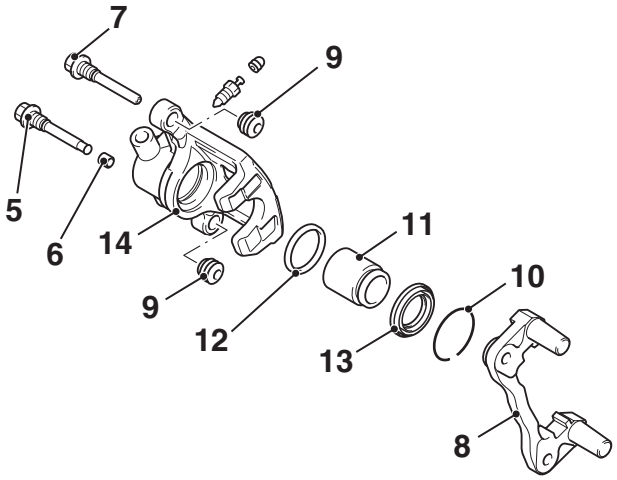




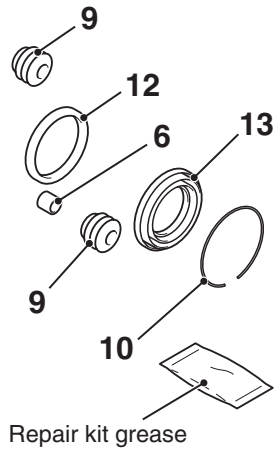
Clip set



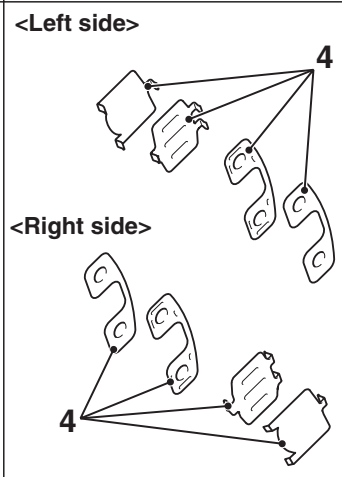
Pad set



Brake caliper kit



Seal & boots kit



Shim kit

AC611778 AB

Disassembly steps

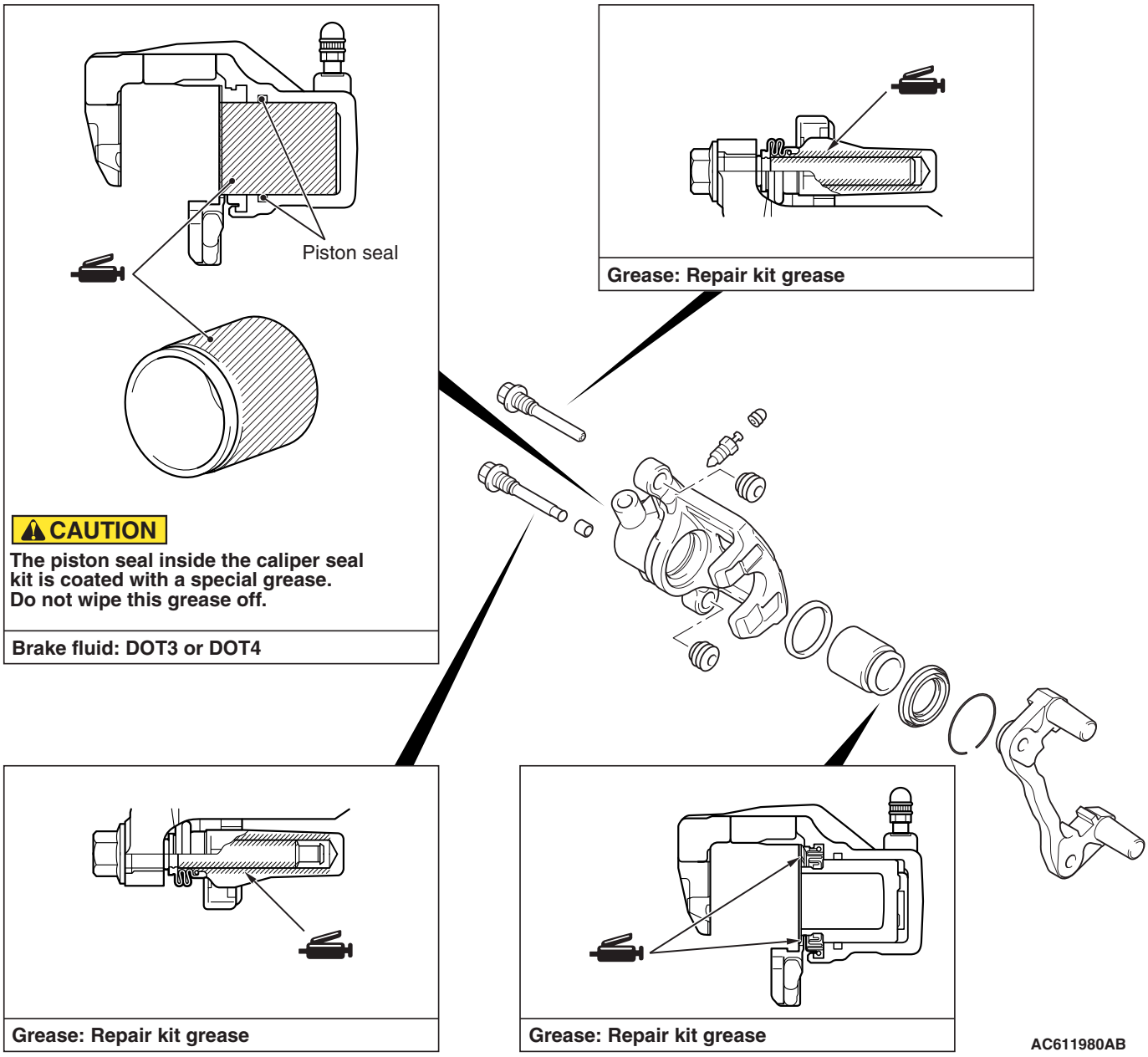
1. Pad & wear indicator assembly
2. Clip
3. Pad & clip assembly
4. Shim <<A>>
5. Lock pin <<B>>
6. Bushing <<A>>
7. Guide pin

Disassembly steps (Continued)

8. Caliper support
9. Pin boot
10. Boot ring
11. Piston
12. Piston seal
13. Piston boot
14. Caliper body

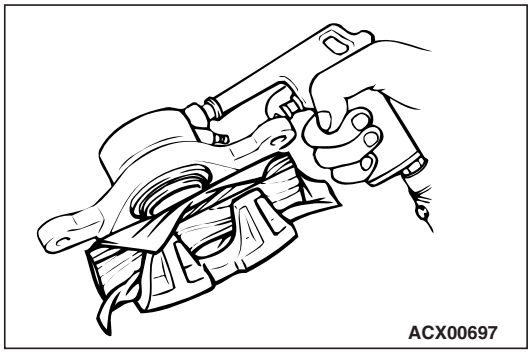
TSB Revision

LUBRICATION POINTS


Piston seal
Grease: Repair kit grease
CAUTION
The piston seal inside the caliper seal kit is coated with a special grease. Do not wipe this grease off.
Brake fluid: DOT3 or DOT4
Grease: Repair kit grease
Grease: Repair kit grease
AC611980AB

DISASSEMBLY SERVICE POINT

<<A>> PISTON/PISTON BOOT REMOVAL

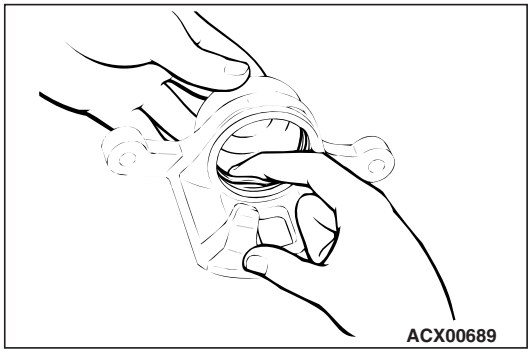


⚠ CAUTION
Blow air gradually to remove the pistons. The pistons will rush out if a force of air is applied suddenly.
Cover the caliper body outer side with a cloth or similar materials. Blow compressed air through the brake hose installation area to remove the piston and piston boot.

<<B>> PISTON SEAL REMOVAL

⚠ CAUTION

Do not use a flat-tipped screwdriver or similar tool to remove the piston seal. These may damage the inner side of the cylinder.

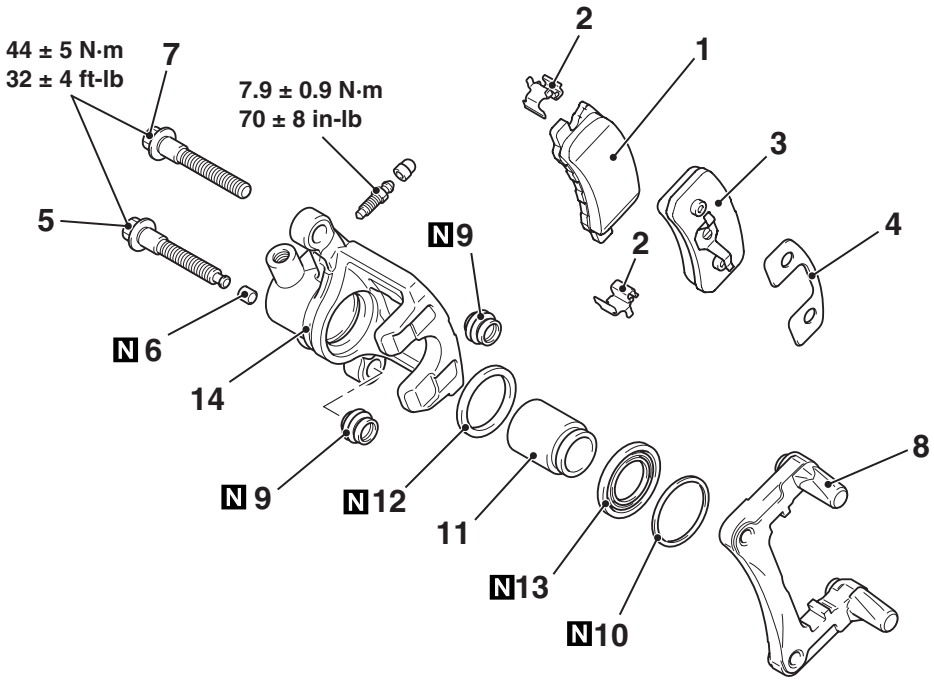


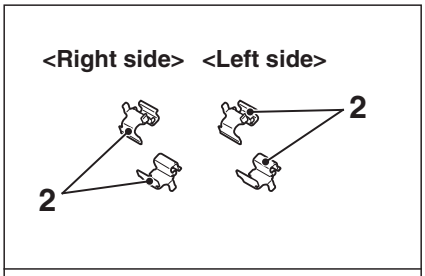
1. Remove the piston seal with your finger tip.
2. Clean the piston surface and cylinder inner face with alcohol or specified brake fluid.

   Brake fluid: DOT3 or DOT4

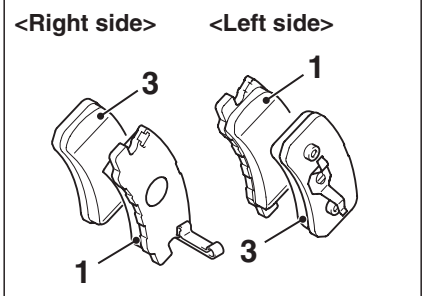
DISASSEMBLY AND ASSEMBLY <Vehicles with 18-inch wheel>

M1351007200716

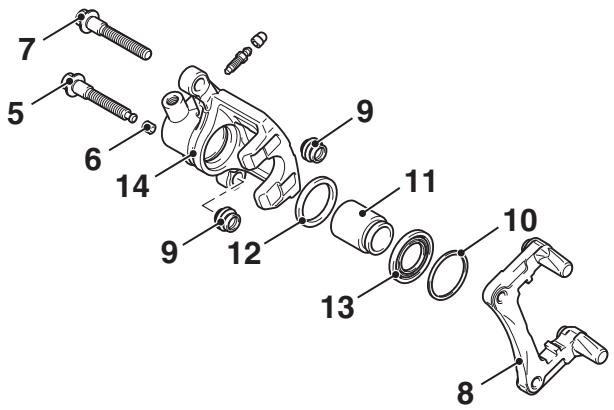




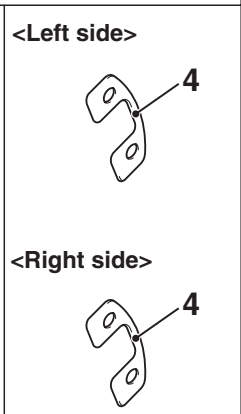
Clip set



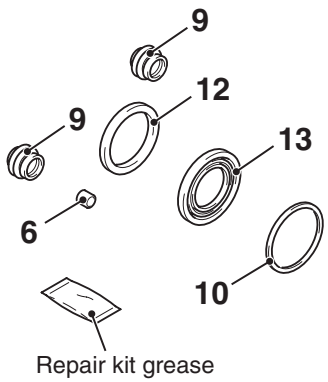
Pad set



Brake caliper kit



Shim kit



Seal & boots kit

AC611977AB

TSB Revision

Disassembly steps

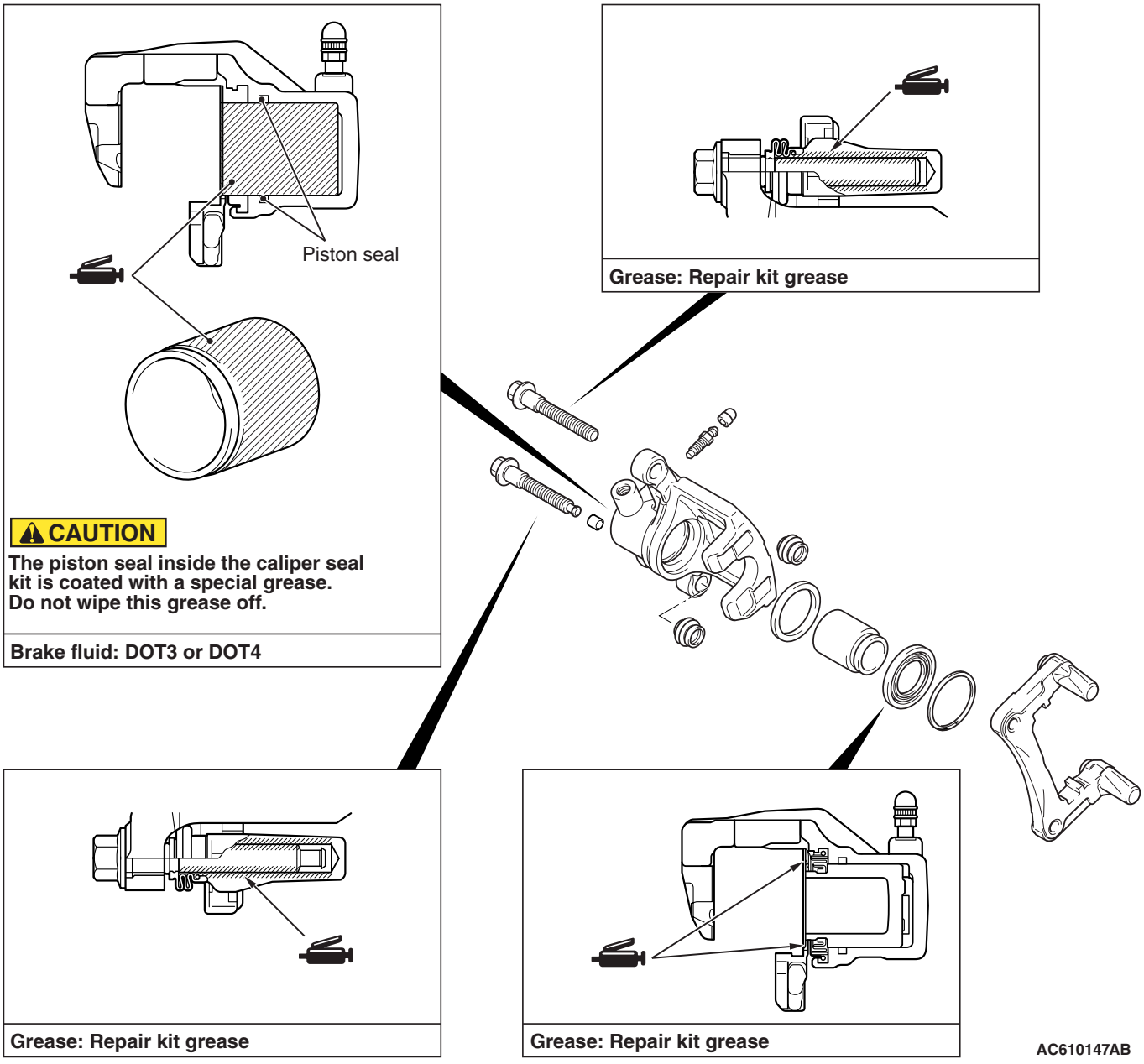
1. Pad & wear indicator assembly
2. Clip
3. Pad & clip assembly
4. Shim
5. Lock pin
6. Bushing
7. Guide pin

<<A>>
<<B>>
<<A>>

Disassembly steps (Continued)

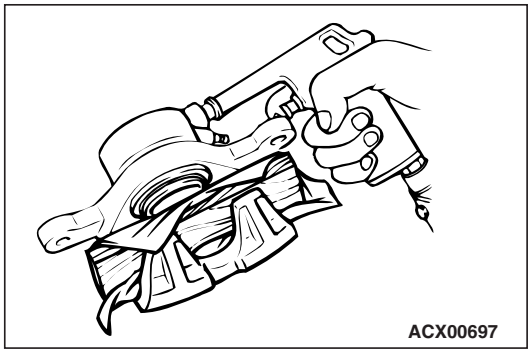
8. Caliper support
9. Pin boot
10. Boot ring
11. Piston
12. Piston seal
13. Piston boot
14. Caliper body

LUBRICATION POINTS


Piston seal
CAUTION
The piston seal inside the caliper seal kit is coated with a special grease. Do not wipe this grease off.
Brake fluid: DOT3 or DOT4
Grease: Repair kit grease
Grease: Repair kit grease
Grease: Repair kit grease
AC610147AB

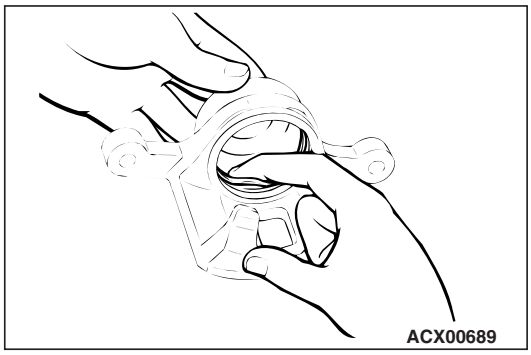
DISASSEMBLY SERVICE POINT

<<A>> PISTON/PISTON BOOT REMOVAL


ACX00697

⚠ CAUTION
Blow air gradually to remove the pistons. The pistons will rush out if a force of air is applied suddenly.
Cover the caliper body outer side with a cloth or similar materials. Blow compressed air through the brake hose installation area to remove the piston and piston boot.

<<B>> PISTON SEAL REMOVAL


ACX00689

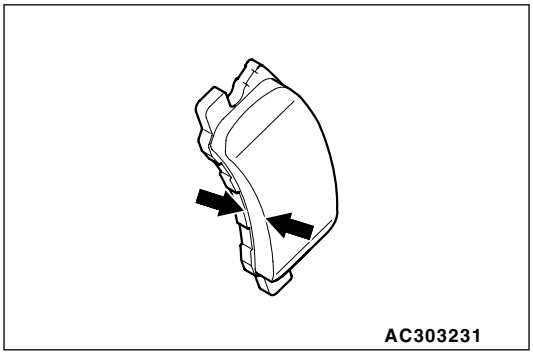
⚠ CAUTION
Do not use a flat-tipped screwdriver or similar tool to remove the piston seal. These may damage the inner side of the cylinder.
1. Remove the piston seal with your finger tip.
2. Clean the piston surface and cylinder inner face with alcohol or specified brake fluid.

   Brake fluid: DOT3 or DOT4

INSPECTION

M1351015000342

PAD WEAR INSPECTION


AC303231

⚠ CAUTION
- **When replacing, replace both pads (right and left) as a set.**
- **If there is a significant difference in thickness between the pads at right and left, check the sliding area.**

Measure the pad thickness at the most worn area. If the pad thickness is less than the limit value, replace the pad assembly.

Standard value: 10.0 mm (0.39 inch)
Minimum limit: 2.0 mm (0.08 inch)

REAR DRUM BRAKE <Vehicles with rear drum brake>

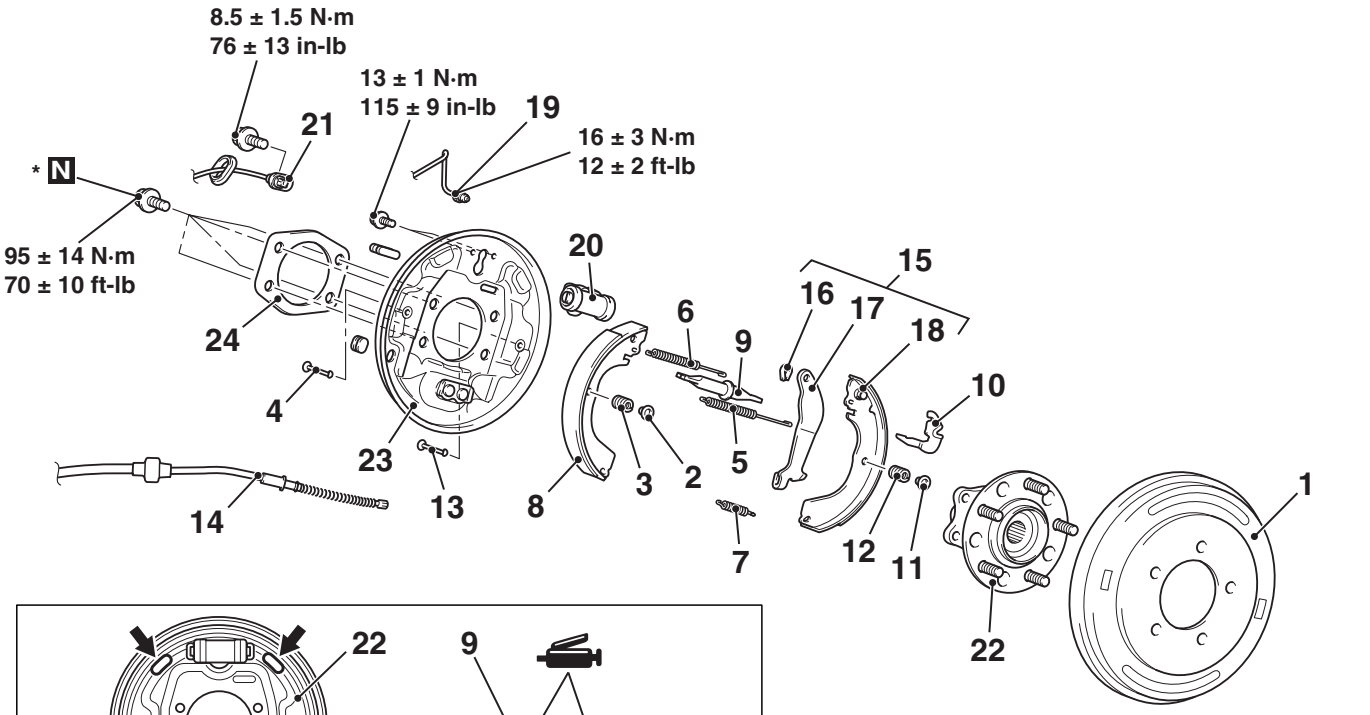
REMOVAL AND INSTALLATION

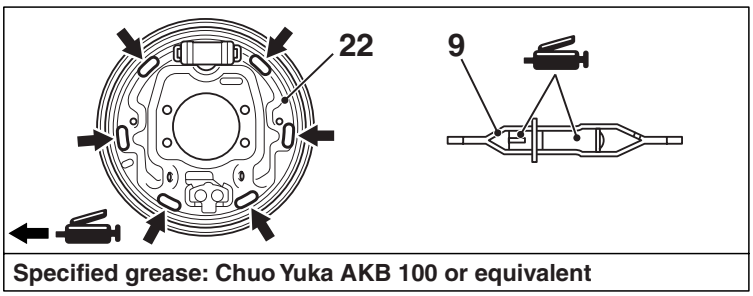
M1351007500762

⚠ CAUTION

- **Do not disassemble the rear wheel hub assembly.**
- **The magnetic encoder collects metallic particles easily, because it is magnetised. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it. <Vehicles with ABS>**
- **When the rear wheel hub assembly is removed/installed, make sure that the magnetic encoder (integrated with inner oil seal) does not contact with surrounding parts to avoid damage. <Vehicles with ABS>**
- **When removing and installing the rear wheel speed sensor, make sure that its pole piece at the end does not contact with surrounding parts to avoid damage. <Vehicles with ABS>**
- **The part indicated with * is the bolt with friction coefficient stabilizer. In removal, replace it with a new one.**

Pre-removal Operation	**Post-installation Operation**
Brake Fluid Draining	• Brake Fluid Filling and Air Bleeding (Refer to P.35A-25). • Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On-vehicle Service –Parking Brake Lever Stroke Check and Adjustment P.36-10).





Specified grease: Chuo Yuka AKB 100 or equivalent

Removal steps

1. Rear brake drum
2. Shoe hold-down cup
3. Shoe hold-down spring
4. Shoe hold-down pin
5. Shoe-to-lever spring

Removal steps (Continued)

6. Shoe-to-shoe spring
7. Retainer spring
8. Shoe and lining assembly
9. Auto adjuster assembly
10. Adjuster lever

TSB Revision

Removal steps (Continued)

11. Shoe hold-down cup
12. Shoe hold-down spring
13. Shoe hold-down pin
14. Parking brake rear cable removal (Refer to GROUP 36, Parking brake cable P.36-13).
15. Shoe and lever assembly

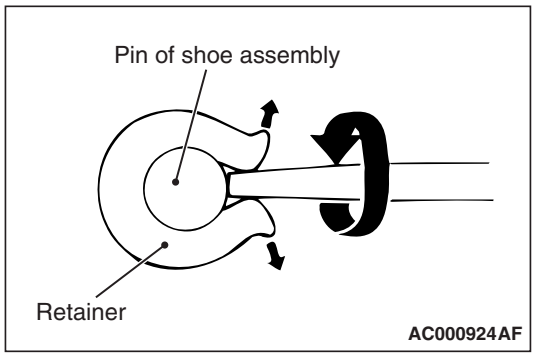
<<**A**>> >>**A**<< 16. Retainer

17. Parking brake lever
18. Shoe and lining assembly
19. Brake pipe connection
20. Wheel cylinder assembly
21. Rear wheel speed sensor <Vehicles with ABS>
22. Rear hub assembly
23. Backing plate
24. Spacer

REMOVAL SERVICE POINT

<<A>> RETAINER REMOVAL

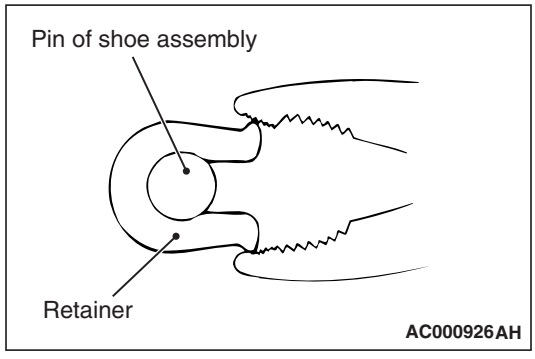
Use a flat-tipped screwdriver or a similar tool to open up the retainer joint. Then remove the retainer.



INSTALLATION SERVICE POINT

>>A<< RETAINER INSTALLATION

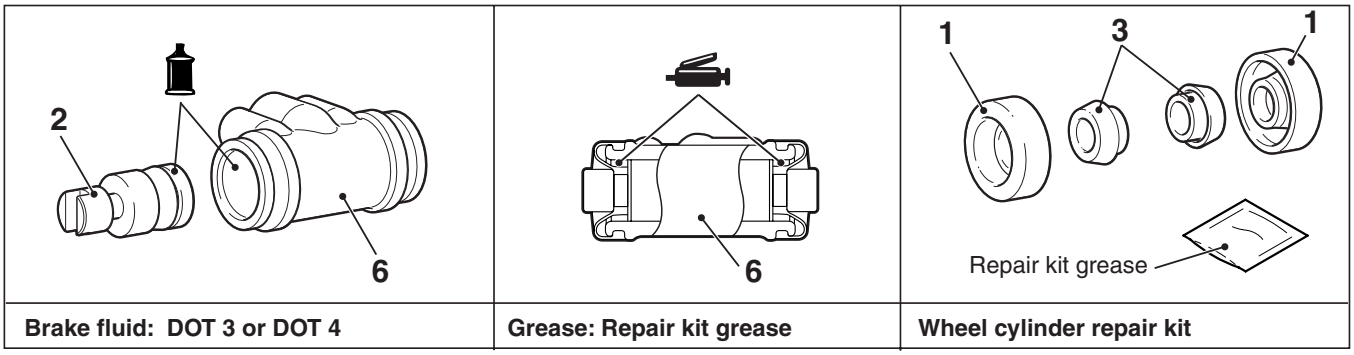
Use pliers or a similar tool to close the retainer end onto the pin.



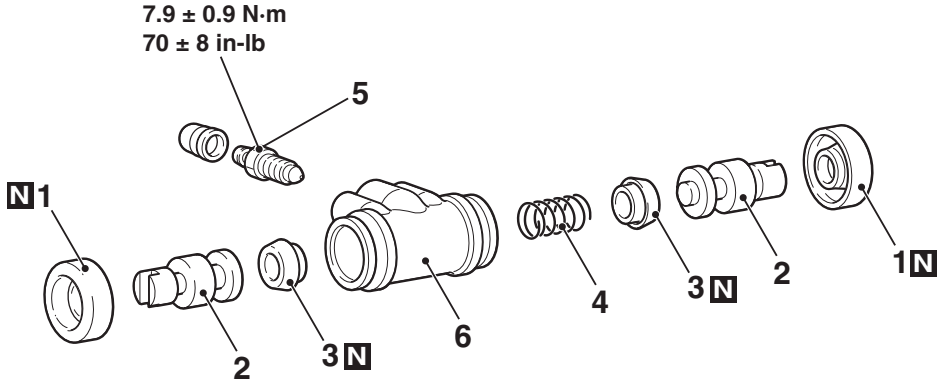
WHEEL CYLINDER

M1351007700584

DISASSEMBLY AND ASSEMBLY



Brake fluid: DOT 3 or DOT 4	Grease: Repair kit grease	Wheel cylinder repair kit



AC611961AB

Disassembly steps

1. Boots
>>**A**<< 2. Piston
>>**A**<< 3. Piston cup

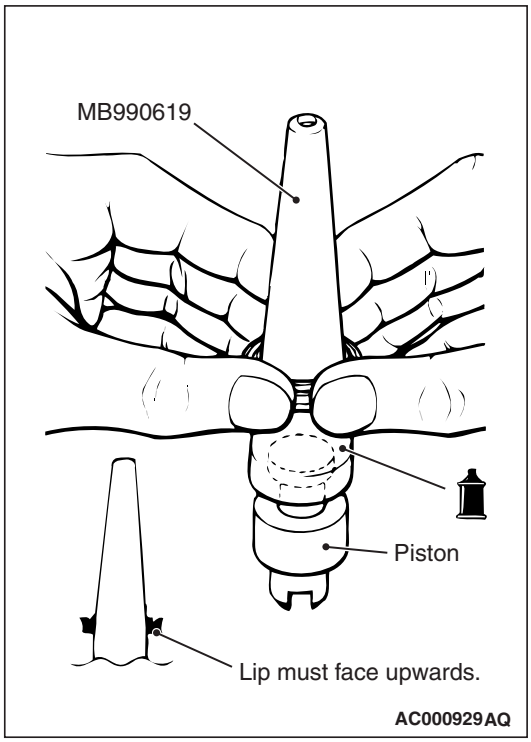
Disassembly steps (Continued)

4. Spring
5. Bleeder screw
6. Wheel cylinder body

ASSEMBLY SERVICE POINT

>>A<< PISTON CUP/PISTON INSTALLATION

1. Use alcohol or brake fluid DOT3 or DOT4 to clean the wheel cylinder and the piston.



⚠ CAUTION

In order to keep the piston cup from becoming twisted or slanted, slide the piston cup down special tool installer (MB990619) slowly and carefully, without stopping.

2. Apply brake fluid DOT3 or DOT4 to the piston cups and special tool installer (MB990619).
3. Set the piston cup on special tool with the lip of the cup facing up. Fit the cup onto special tool, and then slide it down the outside of special tool into the piston groove.

NOTES